



# **Identification of Investment Opportunities in Urban Regeneration Projects**

Master's Thesis  
Department of Real Estate, Planning and Geoinformatics  
Aalto University School of Engineering

Espoo, April 6th 2015

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<b>Title of thesis</b> Identification of Investment Opportunities in Urban Regeneration Projects		
<b>Degree programme</b> Degree Programme in Real Estate Economics		
<b>Major</b> Real Estate Investment and Finance		<b>Code</b> M3009
<b>Thesis supervisor</b> Professor Kauko Viitanen		
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<b>Date</b> 06.04.2015	<b>Number of pages</b> 58	<b>Language</b> English

### **Abstract**

The evolution of cities creates a socioeconomic system which generates investment opportunities for the actors within real estate sector. These opportunities occur through large scale urban development projects which aim to regenerate wide areas of the city structure. Although the initiative derives mainly from the public authorities, the involvement of the private sector plays a significant role for the success of such projects. However, the complexity of urban regeneration schemes poses definite challenges for a robust and accurate investment analysis.

This thesis initially investigates the relation between real estate development and urban regeneration. Thereafter, it examines the approach of the real estate sector, focusing mainly on the perspective of the property developers, by identifying and evaluating the emerging investment potentials in urban regeneration projects. The research methods include a literature review as well as an empirical study from the property market of Helsinki Metropolitan Area.

The literature part reviews the theoretical framework of urban regeneration and real estate development and combines their features in a separate chapter. In particular, urban regeneration is examined as an investment process with certain content, context, and organisation; the DCF comprises the prevailing method for the investment analysis. The findings of the literature review indicate the employment of more sophisticated risk analysis methods in order to capture the high complexity and the required flexibility of urban regeneration projects.

The empirical study is performed by semi-structured interviews with real estate developers and investors. The results of the case study underpin the findings of the literature review, in terms of capturing latent opportunities and providing higher flexibility in the investment analysis. However, real estate developers believe that this flexibility derives from complex quantitative methods which are hard to grasp and comprise rather an encumbrance than facilitating the decision-making process.

The findings of the thesis can be utilised for further research by conducting quantitative analysis on particular projects. This spherical approach can provide a solution in balancing the trade-off between the robustness and the clarity of the investment analysis.

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**Keywords** urban regeneration, real estate development, real estate valuation, real options analysis, risk management

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## **Acknowledgements**

The current thesis comprises the final work of the author in the frame of the Master Programme in Real Estate Investment and Finance of Aalto University. Throughout the programme I gained significant knowledge and experience, and I would like to thank all the professors and the teaching staff for their contribution. In particular, I would like to thank my instructor Jussi Vimpari for his assistance from the early stages of this study, as well as my supervisor Kauko Viitanen for the timely feedback and the approval of the thesis.

Furthermore, I owe sincere gratitude to Arttu Ruismäki as well as to Katriina Lardot for facilitating the arrangements of the interviews. This might have been minor support on their behalf but of great significance for me. In addition, I would like to thank all the interviewees for providing their precious time and insights. I enjoyed every moment of the interviews which resulted in fruit-full discussions with interesting people.

Finally, my special thanks go to all my friends who transformed my free time to beautiful memories during my staying in Finland. Particularly, I would like to thank Evisa Tsolakou not only for her friendship but also for her technical support throughout my studies. Last but not least I would like thank Fay for being an infinite source of inspiration. Closing this foreword, I would like to dedicate this work to my family which is responsible, in a large extend, for my inquiry mind.

Espoo, 6th of April 2015

Emmanouil (Manos) Tsimperis

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# **PART I – Introduction**

## **1 Introduction**

### **1.1 Background**

Urban regeneration appears as a great challenge of transforming the living environment of the cities taking the role of an economic and social mechanism. Although public authorities have the first role, such initiatives also involve business incentives on behalf of the private sector (real estate developers/ investors). As cities evolve, their political, economic and social systems generate new demands and present fresh opportunities for economic growth (Roberts, 2000). Real estate developers attempt to capture these opportunities aiming at maximising their benefits from their involvement in urban regeneration projects. However, the dynamic process of the progress of urban areas cultivates a highly uncertain investment climate which does not ensure a long-term profitability.

Therefore, the inherent uncertainty in urban regeneration poses many difficulties in order to initiate a redevelopment project with guaranteed feasibility throughout its whole life-cycle. Many dilemmas arise such as the marketability of the project as well as the selection of land uses which will maximise the financial returns. Falk (2004) denotes the significance of a phased strategy in confronting the above barriers and establishing the foundation of success in urban regeneration projects. In fact, a variety of authors (Kang, 2004; Geltner et al., 2007; Masunaga, 2007; Rocha et al., 2007; Wang et al., 2009; Sattarnusart, 2012) examine phasing of real estate development as a real option employing Option Pricing Theory (OPT) in order to provide a numerical value to this option. Furthermore, Real Option Analysis (ROA) can compute values for other options such as the option to wait for the proper timing, the option to switch uses according to the requirements of the market or even an exit option.

In addition, the paradigm of the renewal of urban areas in the UK relates the rehabilitation of cities with property development. Nappi-Choulet (2006) denotes the property-led urban regeneration policy of the mid 1980s through Public Private Partnerships (PPP). This trend was also proliferated in other western European societies as a movement of new urbanisation (Swyngedouw et al., 2002). Thus, the valuation methods and risk management techniques which are used in real estate development are considered as essential in order to implement an investment analysis of urban regeneration.

Furthermore, the British literature has examined the attraction of private capital and institutional investors in regeneration investments. In all cases, the balance between risk and return constitutes the key element of the investment decisions. In particular, real estate investors perceive redevelopment projects as high risk, low return investments (Adair et al., 2000). Thus, urban regeneration occurs mostly as an initiative of the real estate developers and the policy makers. Nevertheless, D'Arcy and Keogh (1997) stress the high significance of the participation of the different functions of the property markets in urban change, taking examples from various European cities.

Helsinki Metropolitan Area (HMA) comprises another example of urban regeneration that it has recently been commenced. In particular, the planning authorities of the city of Helsinki have drawn a new master plan which contains a land use vision until 2050. The

implementation of this master plan consists of land and buildings for future development according to the set goals. The under discussion issues include traffic solutions, residential housing or businesses, and infrastructure. (Helsinki City Plan, 2013)

As a result of the above premises, this study attempts to investigate the future development opportunities in Helsinki region taking into account the theoretical framework of urban regeneration and real estate (re)development. In particular, the thesis focuses on the effective risk management which maximises the gains of the development schemes, and the financial returns of real estate investors. In order to achieve this aim firstly, a literature review is conducted in order to link the theories behind urban regeneration and real estate development. Subsequently, an empirical study is deployed in order to examine the perception of private sector about the emerging investment opportunities and the management of uncertainty in urban regeneration projects. Finally, the concluding remarks are presented as a combination of the literature review and the empirical findings.

## **1.2 Objectives**

The principal objective of this thesis is to identify and evaluate the investment opportunities for the private sector that are generated from the structural reformations of HMA. In addition, an explicit attention on risk management methods underpins a robust assessment of the above investment opportunities. Thereafter, a further investigation is conducted concerning the participation of real estate investors in urban regeneration schemes. These objectives can be also presented in the form of the following research questions and sub-questions:

- 1) How is real estate development involved in urban regeneration?
  - a) What does the concept of urban regeneration includes?
  - b) How has urban policy evolved and what is the role of the property market?
- 2) How do real estate developers evaluate the emerging opportunities?
  - c) What valuation and risk analysis methods are employed?
- 3) How do real estate developers communicate risks to investors/stakeholders?
  - e) What is the role of risk communication in financing urban regeneration?

## **1.3 Scope of the Study**

The study focuses on urban regeneration projects mainly from the perspective of real estate developers. The concepts of urban regeneration and property development are defined and linked according to the existing literature. In addition, both concepts comprise an investment process which frequently involves various investors, institutional or from the real estate market specifically. Therefore, the level and the motives of participation of these investors are also examined in the literature review. The empirical analysis attempts to validate or reject the propositions of the presented theory, as well as to provide useful insights about the process of investment analysis and the role of the private sector in urban regeneration. As a result, the involvement in urban regeneration projects is a critical factor for the selection of the interviewees, both from the side of the developers and the investors.

## **1.4 Research Structure**

The structure of the study consists of four parts. The first part comprises the introduction and includes the research background, its objectives and methodology. The second part reviews the existing literature concerning the concepts of urban regeneration and real estate development. Thereafter examines urban regeneration as an investment process combining



the outlined theories. The third part pertains to a case study that investigates primarily the perception of real estate developers about the emerging investment opportunities in HMA regeneration. Furthermore, this case study considers the perspective of the potential investors and explores the communication of the inherent risks to them by the developers. Finally, the last part discusses the findings of the study as they derive from both the literature review and the empirical study.

## **1.5 Materials and Methods**

The methodology of the thesis is two-fold and consists of a literature review as well as an empirical study from the property market of HMA. The first one provides the definitions of the discussed concepts and establishes the research objectives and propositions of this thesis. The second one attempts to discover the practical value of the theoretical framework, investigate the risk management practices in urban regeneration and examine the contribution of valuation methods in the overall outcome.

In particular, the literature material consists of several articles published in international journals, some related books and lecture presentations. The articles and books were found initially through online search, using the key words which are listed in the abstract, and subsequently in the reference list of the selected material from the online search. A certain amount of this material derives from hard copies and the other exists in electronic form. Hard copies were collected from Aalto University and University of Helsinki libraries as well as from the personal collection of the author. Online search was conducted via electronic databases such as Nelli portal, Scopus, and Melinda, as well as the platform of Google Scholar. A detailed list of the literature and its sources can be found in the references section.

The case study of HMA regeneration comprises the empirical analysis of this thesis as it constitutes a suitable strategy to answer the “how” and “what” research questions that have been developed in the section of the objectives. Case study as a research method has the ability to explore and explain a phenomenon within real life context when the researcher has little control over the events. (Yin, 2013)

Yin (2013) describes the structure of a case study in five steps:

- 1) Research questions, which will determine whether the case study constitutes the appropriate research method.
- 2) Research propositions or in other words the purpose of the study, which will lead the investigation towards the right direction and set the criteria that will determine the success of the study.
- 3) Unit of analysis, which determines the research design and data collection strategy. The proper selection of unit of analysis derives from the thoroughly specified research questions.
- 4) Linking data to propositions, which actually requires the combination or assembling of the case study data as a reflection of the initial research propositions.
- 5) Criteria for interpreting the findings which are mostly applicable in quantitative research.

## **PART II – Literature Review**

### **2 Urban Regeneration**

The current chapter introduces the concept of urban regeneration as it has been defined by urban policy and urban change. Subsequently, a presentation of the evolution of urban policy follows, mainly in Europe, and signifies the linkage between urban regeneration and real estate markets. Finally, the chapter concludes with a review of property-led regeneration and its realisation through the development of prestige projects.

#### **2.1 The concept of Urban Regeneration**

Urban areas exist as dynamic structures providing a wide range of functions within a certain territory. As the time lapses, the balance of these territories alter in the name of evolution or due to certain circumstances of the macro environment. This urban change has multiple aspects and signifies either the growth or the decline of cities according to their capacity to adapt.

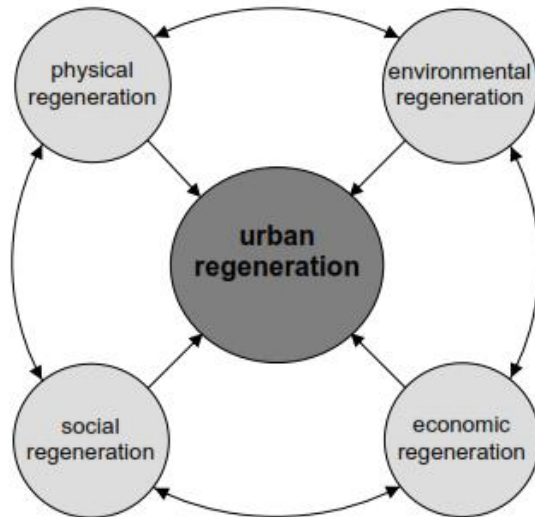
Urban regeneration takes the form of an intervening action in order to confront urban decline and rectify possible market failures. Robson (2000) distinguishes three disparate spatial levels to intervene: the region, the city and the neighbourhood. The suitability of each level varies regarding the policy sector and different indicators might be deployed. For instance, economic indicators may include deindustrialisation, manufacturing depression, increasing unemployment, welfare dependency, and infrastructural decay (McCarthy, 2007).

Jones and Evans (2008) denote the amelioration of the negative effects of deindustrialisation, across Europe and the USA, as the commencement of urban regeneration. This attempt aimed to enable cities to attract new investments in the global economy through a vast economic transformation. In addition, the emerging globalisation created an economic competition among cities beyond the regional and national level; this competition occurs in terms of keeping industrial production or in marketing of cities as residential and tourist destinations (Loftman and Nevin, 1995; Smith, 2002; McCarthy, 2007).

Lang (2005) also adds factor constraints which derive from the use and the availability of land and the built environment as another element of urban change. Furthermore, the real or the perceived unattractiveness of urban areas constitutes another reason for spatial alteration (Robson, 2000). In addition, these economic and territorial reformations result in social consequences, demographic pressures and geographical shifts. Smith (2002) denotes this phenomenon as a gentrification process while Rodriguez et al. (2001), and Diaz Orueta (2007) highlights social segregation as an outcome of immigration flows and precipitated growth.

The jigsaw of all the above features comprises the process of urban change and therefore, urban regeneration consists of four different axes, economic, social, physical and environmental, as it can be noticed in the Figure 2.1. Based on these axes, Lang (2005) implies a general agenda and a cross-sector integration which have urban regeneration as a focal target. Simultaneously, Couch and Frazer (2008) define urban regeneration as a public policy. The goals of this policy include the re-growth of economic activity, the restoration of social function, and the restoration of environmental quality or ecological

balance. Thus, urban regeneration implements the management and planning of existing urban areas rather than the planning and development of new urbanisation. The Office of the Deputy Prime Minister (ODPM) in the UK conceptualise the regeneration policy as: “the holistic process of reversing economic, social and physical decay in areas where it has reached a stage when market forces will not suffice” (Lang, 2005).



**Figure 2.1 The Concept of Urban Regeneration (Lang, 2005)**

Roberts (2000) reaches a deeper analysis by identifying five key themes from the past of urban change and policy:

- The relationship between physical conditions and social response
- The constant need for the physical replacement of many elements of the urban fabric
- The importance of economic success as a foundation for urban prosperity and quality of life
- The need to make the best possible use of urban land and to avoid unnecessary sprawl
- The importance of recognising that urban policy mirrors the dominant social conventions and political forces of the day

In addition to the above themes, a new objective appeared in the sphere of urban policy during the 1990s. This goal refers to the need of long lasting development with respect to the environment which is known as sustainable development. Incorporating this emerging theme to the five ones from the previous eras, Roberts builds a broader definition of urban regeneration which is perceived as:

“Comprehensive and integrated vision and action which leads to the resolution of urban problems and which seeks to bring about a lasting improvement in the economic, physical social and environmental condition of an area that has been subject to change” (Roberts, 2000).

The output of urban regeneration process can be classified into five separate categories: neighbourhood strategies, training and education, physical improvements, economic development and environmental action (Roberts, 2000).

## **2.2 The Development of Approaches in Urban Policy and Urban Regeneration**

The development of urban policy provides significant insights concerning the scope and range of urban regeneration. The direction of the strategic agenda for urban change is determined by the prevailing conditions of each period and the specific characteristics of different areas. As a result, public authorities adopt area-based policies in order to resolve the emerging and existing problems of their geographical territory. Although these policies focus on economic and physical investments (Lloyd and Black 1993; Robson, 2000) a holistic approach to urban regeneration strategies consists of many dimensions as discussed earlier. Colantontio and Dixon (2009) distinguish six main approaches to area-based (urban) regeneration and renewal:

- Property-led physical approach, where a usually mixed use scheme is expected to have multiplier effects in the local economy
- Business-driven approach, which focuses on the regeneration of “underserved markets” through business investments
- Urban form and design perspective, which highlights the significance of the relationship between sustainable development and urban form
- Cultural industries approach, which stresses the significance of creative and cultural media industries as vehicles for regeneration
- Health and well-being perspective, which accentuates the role that well-designed space can have on neighbourhood health and liveability
- Community-based, social economy approach which highlights the importance of involving local communities in decision-making and developing social capital networks

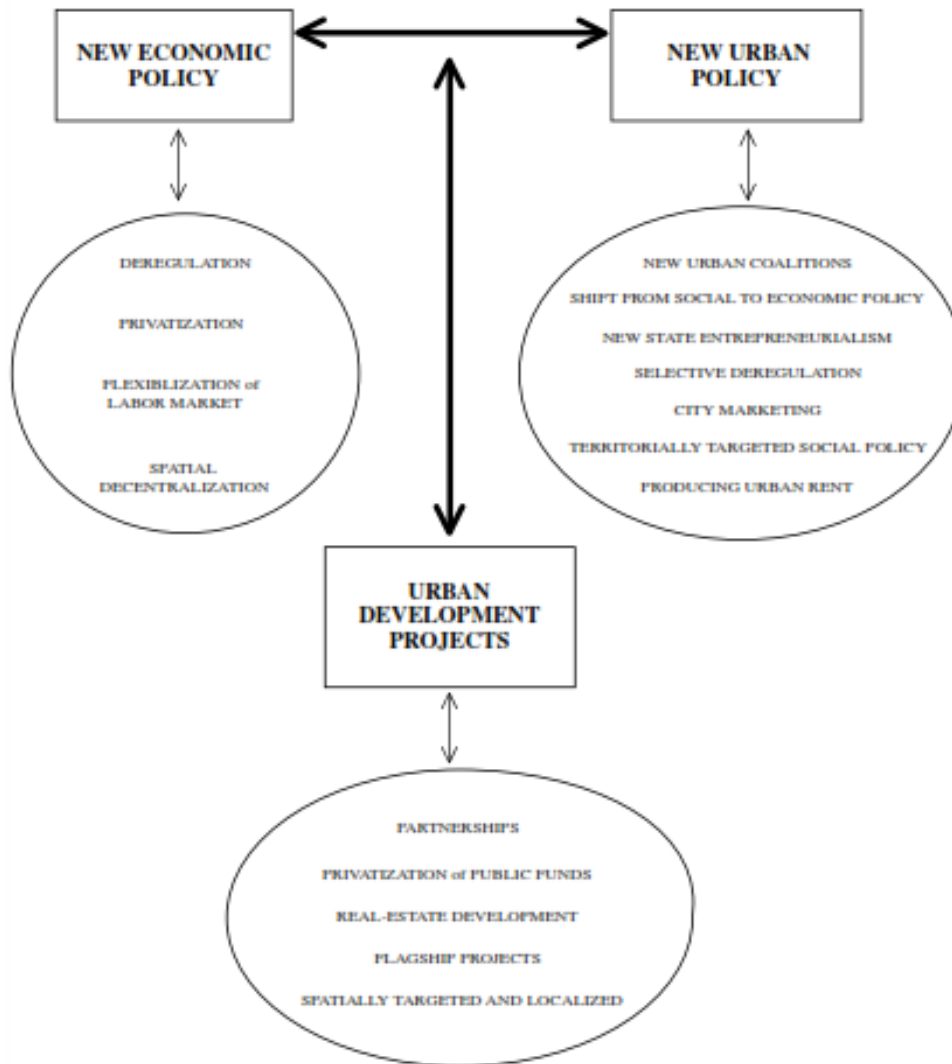
The British experience in urban change and policy has served as a pilot for the other western European regions as Britain is one of the first countries, with Germany and France that was called to confront urban decline. The evolution of urban policy in the UK goes back to 1945, after the end of the Second World War, where it was regarded as an intervening public action for reconstruction; suburban and regional growth constitute the basic orientation. After the 1970s and during the 1980s, the private sector begun to gain influential role following the paradigm of the USA of a market-led approach for urban revitalisation (Loftman and Nevin, 1995; Robson, 2000; Carriere and Demaziere, 2002; Lang, 2005; McCarthy, 2007; Colantontio and Dixon, 2011). In theory, this revitalisation should alter economic hierarchies and functions, create new jobs and reinforce the position of urban areas in the division of labour (Swyngedouw et al., 2002).

Roberts (2000) describes the trajectory of British urban policy from 1950s – 1990s to five types of periods: reconstruction (1950s), revitalisation (1960s), renewal (1970s), redevelopment (1980s) and regeneration (1990s). As he notes, urban regeneration moves beyond urban redevelopment, which has no well-defined purpose. Moreover, in urban renewal physical change becomes the centre of attention and urban revitalisation lacks a specific strategy (Roberts, 2000). Colantontio and Dixon (2011) indicate the emphasis of each strategy as: physical redevelopment for the first period; social welfare for the second; economic prosperity for the 1970s; property-led regeneration for the 1980s; community partnership for the last decade of the 20<sup>th</sup> century; and sustainable places after 2000s. The table 2.1 depicts the above trajectory.

**Table 2.1 The Evolution of Urban Policy (Roberts, 2000; Colantontio and Dixon 2011)**

<b>Evolution of Urban Policy</b>		
	<b>Policy</b>	<b>Strategy</b>
<b>1950s</b>	Reconstruction	Physical Redevelopment
<b>1960s</b>	Revitalisation	Social Welfare
<b>1970s</b>	Renewal	Economic Prosperity
<b>1980s</b>	Redevelopment	Property-led Regeneration
<b>1990s</b>	Regeneration	Community Partnership
<b>2000s</b>	Sustainable Development	

Similarly, redevelopment strategies dominated urban policy across European cities as a part of a new economic policy and a new urbanisation. This led to a massive expansion of the real estate sector which was expressed in large scale urban development projects that subsequently fostered Public Private Partnerships (PPP); this is illustrated in Figure 2.2. An enhanced social and economic return constitutes the main objective of these projects as well as revaluing prime urban land (Swyngedouw et al., 2002). However, the enhancement of land values reveals the phenomena of gentrification and social exclusion (Collantonio and Dixon, 2009; Macleod and Johnstone, 2012; Tallon, 2013).



**Figure 2.2 New Urbanisation in Europe (Swyngedouw et al., 2002)**

In the UK, the first appearance of such urban regeneration initiatives arrived with Urban Development Corporations (UDCs) and Enterprise Zones (EZs). The latter constituted the major provider of new floor-space (Adair et al., 2002). City Challenge and Single Regeneration Budget (SRB) followed proving the persistence of area-based regeneration. Urban Regeneration Agency or the descendent English Partnerships (EP) worked in parallel with SRB and afterwards Regional Development Agencies (RDAs) were founded. English Partnerships consistently played a significant role promoting the goal for sustainable development with the broader objectives of RDAs (McCarthy, 2007). Furthermore, English Partnerships established the Urban Regeneration Companies model in order to co-ordinate and facilitate the urban regeneration process (Adair et al., 2002; McCarthy, 2007).

The scene in other European countries often varies significantly and urban policy comprises the combination of different sectoral policies and urban planning laws rather than a consistent political and strategic direction (EC, 2014). Nevertheless, the European Commission (EC) underpins the trend of urban development projects with programs such as “Urban Sustainable Development in the EU: A Framework for Action”, “Europe 2000”

and 2000+, as well as the Community initiative URBAN (Robson, 2000; Carter, 2000; Colantontio and Dixon, 2009). URBAN is the predecessor of URBACT that has run until today (URBACT, 2007). In 2006, EC developed two structural funds as financial instruments for its regional policy, the European Regional Development Fund (ERDF) and the European Social Fund (ESF). Despite the regional character of these tools, a major proportion of their budget refers to cities (Colantontio and Dixon, 2011).

However, the recent economic recession intensifies the pressures to land and property asset prices, questioning the long-term feasibility of urban regeneration projects (Collantonio and Dixon, 2011). Therefore, public investments have been reduced forcing regeneration programs, such as RDAs, to an end (Tallon, 2013). In addition, the overall target of sustainable development faces challenges to align with the general consensus of the disparate stakeholders of urban regeneration. Tallon (2013) argues that urban problems have found limited solutions; community participation remains problematic and spatial and social polarisation leads to growing imbalances between cities. Despite the above mentioned criticism, property development still remains a high priority in the urban agenda of local authorities as a tool of economic growth (Doucet, 2007).

### **2.3 Urban Regeneration and Property Development**

Property-led strategies take the form of large scale Urban (re)Development Projects (UDPs) which are also found in the literature as flagships. The complexity and the high level of risk of such projects lead to the collaboration of a wide range of stakeholders, often from both the public and the private sector (Loftman and Nevin, 1995; Diaz Orueta and Fainstein, 2008). The vast majority of the case studies involve the creation of a mixed land use area which might include business parks, conventional centres, shopping malls, hotels, sports and cultural facilities, museums and/or residences.

In addition, urban regeneration projects occur in Central Business District (CBD) and waterfront locations or in other words in prime urban land. As Loftman and Nevin (1995) argue, these locations provide the greatest investment potentials and financial returns. The land types comprise Brownfield sites (old industrial places or old harbours), historic city districts and in general deprived areas due to social issues, economic shifts and physical obsolescence.

Urban regeneration projects play a catalytic role in elevating the image of the city, attracting foreign investments, stimulating the economic environment and causing a general euphoria in the wider region (Loftman and Nevin 1995; Swyngedouw et al., 2002; Carriere and Demaziere, 2002; Doucet, 2007). The success of the schemes depends on the ability to hearken to the local market requirements (D'Arcy and Keogh, 1999). These requirements mainly include the production of urban rent but also the creation of capital value (Swyngedouw et al., 2002).

Furthermore, D'Arcy and Keogh (1999) argue that the property market mechanism has the responsibility to generate the required finance, share the risks efficiently as well as manage and promote the whole project effectively. As a result, property market processes determine real estate transactions, property values, and the allocation of space between competing uses as well as the roles of the different parties involved (D'Arcy and Keogh, 1998&1999). In addition, the appropriate comprehension of the property market processes leads to the identification of current and future investment opportunities.

The paradigm of Baltimore stands as a prototype of success which influenced urban authorities in Europe in order to adopt a property-led urban regeneration policy. This project comprises a combination of a shopping centre, leisure activities, conference centre and an aquarium in the location of an old harbour. Based on the same waterfront redevelopment model, the city of Barcelona was transformed in order to host the Olympic Games in 1992. In a similar vein, Bilbao redeveloped the Abandoibarra area promoting Guggenheim Bilbao Museum (GBM) as its most emblematic attraction. Furthermore, the paradigm of Amsterdam in the Netherlands underpins the success of property-led regeneration.

Despite the similarities in the development strategy of the schemes different key factors lead to the successful result. In the first case this result derived from a strong delivery mechanism based on a well coordinated PPP (Wang, 2002). The case of Barcelona outputted a well planned regeneration which had economic and social balance (Wang, 2002). The delivery mechanism in terms of timing and marketing played the most significant role in Abandoibarra project (Rodriguez et al., 2001). Lastly, the creative master plan of Eastern Dockland in Amsterdam metamorphosed the scheme into an urban development master piece (Wang, 2002).

As it can be noticed, every city exploits prestigious events and/or innovative and flagship projects which provide the opportunity to attract the attention of the global community. However Keating (1991) argues that this has led to a process of imitation, a phenomenon that he calls it “clone cities”. In addition to this replication, the success of previous projects drove many initiators of similar ones to over optimism and hence to an oversupply which it was impossible to be covered by the actual demand. Canary Wharf comprises a typical example of that where 40 million ft<sup>2</sup> of office space remained vacant after its completion.

Furthermore, Falk (1986) argues that the investment on urban regeneration projects relies on political and professional insights rather than a robust feasibility study. In particular, he mentions that the conception of an aquarium in Baltimore was nothing more than an intuition which stood as an extraordinary attraction at that time. Therefore, large scale UDPs entail serious financial risks due to periods of high speculation. (Loftman and Nevin, 1995)

The participation of the private sector appears quite contradictory due to the great uncertainty and complexity that accompanies urban regeneration projects. On one hand, most of the schemes involve private investments but on the other hand public sector undertakes the largest proportion of risks and financing. For instance, Canary Wharf project received a subsidy of £1.3 million in tax exemptions along with a very low price, compared to the market standards, for the acquisition of the land (Loftman and Nevin, 1995). Also, the involvement of the state in the Expo 1998 project in Lisbon resulted in covering deficits which constitutes a quite common case in many schemes (Swyngedouw et al., 2002).

As a result, private investors face definite challenges to commit to UDPs without favourable terms on behalf of the public authorities. This implies a PPP where private sector gains the majority of the benefits while the state bears the majority of the costs and the risks. The issue concerning the financing of urban regeneration will be further discussed in the forth chapter.



### 3 Investment Decisions in Real Estate Development Projects

This chapter discusses the complexity of real estate development projects which derives from a compound process that occurs within a wide economic environment of great uncertainty. In addition, it presents the prevailing valuation method of investment opportunities as well as examines the techniques that decision makers use in order to overcome the uncertainty and manage the risks. Subsequently, a review of ROA follows denoting its main concepts, methods and general contribution in the evaluation and risk management of real estate development projects.

#### 3.1 Real Estate Development Process and the Inherent Uncertainties

Geltner et al. (2007) define real estate development as a process where within the dimensions of space and time financial capital becomes fixed as physical capital. The process consists of many disparate stages which entails a very repetitive decision making procedure. In every case, the goal is to increase the value of land and maximise the profit. Depending on the nature of the project some of the stages could be circumvented or followed in a different order. Cadman and Topping (1995) propose an eight-stage development process (Initiation, Evaluation, Acquisition, Design and Costing, Permission, Commitment, Implementation, and Management and Disposal), Myles et al. (2007) follow similar pattern using slightly different terms, while Ratcliffe et al. (2004) adopts a less composite development process with five stages (concept and initiation, appraisal and feasibility study, design and evaluation, contract and construction, and marketing, management and disposal). Also the Royal Institute of Chartered Surveyors (RICS, 2012) describe a five stage built facility with a slight differentiation from Ratcliffe et al. (concept and appraisal, design, construction, occupancy, disposal).

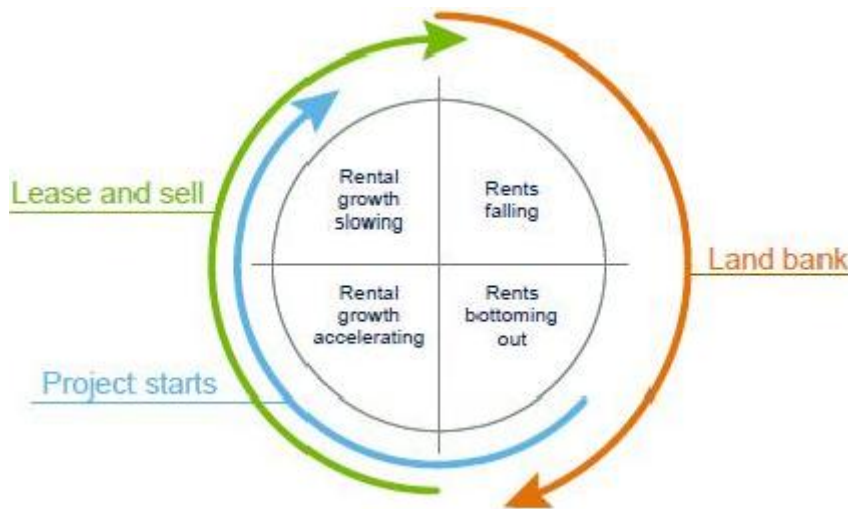
In a similar vein Gehner (2008) illustrates five disparate phases of the development process but simultaneously denotes a monitoring moment between them (figure 3.1). The latter can also be underpinned by a survey of RICS (2012) concerning the management of risks. In particular, the survey examines the perception of the project managers about risks which vary according to the development phase. This implies a constant alteration of the uncertain factors which exist as an integral part of the development process. Thus, it is generally accepted that real estate development comprises a dynamic and complex process, despite the certain differences that exist concerning the number and the name of the disparate stages.



**Figure 3.1 Development phases and investment decision moments in the real estate development process (Gehner, E., 2008)**

However, the property development schemes operate in a wider environment which is greatly influenced by the economic and business cycles. Therefore, the investment decisions are also prone to external factors that influence the progress of the project. These factors include economic, financial, political, legal, physical, occupational, leasing, market

and valuation uncertainties (RICS, 2011). The outlined relationship of the property development, economic and business cycle is illustrated in the following figure.



**Figure 3.2 Linkage between property market, economic and business cycle (Laura Yrjänä, 2013)**

As a starting point, the increase of the demand in the property market signifies the rise of real property values (i.e. rents and capital values) which motivates the initiation of development projects. If this initiative is supported by a credit expansion it could lead to an economic flourish. Yet, real estate supply is fixed in the short-term and it requires some time to emulate the increasing demand and as a result, prices escalate continuously. By the time the development cycle reaches its peak, the business cycle has already moved into a downturn while inflation applies pressure to the economy and a more rigorous monetary policy seems inevitable. As the economy sinks, the demand for real property declines, real estate values drop and thus, the stock in the property market increases. Consequently, the economy plunges into a recession, the fall of property prices remains, development schemes deal with financial illiquidity, the hazard of bankruptcy emerges and the development cycle is decaying. (Cadman and Topping, 1995)

In conclusion, uncertainty exists as an inherent part of the real estate development process and derives both from internal and external factors. Risk emerges from this uncertainty as a measurement tool that developers have to consider during the valuation of their investment. The Discounted Cash Flow (DCF) comprises the most appropriate method to value assets that generate cash flows according to the International Valuation Standards Council (IVSC, 2012). The basic concepts and functions are described in the following section.

### **3.2 Valuation of Real Estate Using the DCF method**

After the initiation of the project, the feasibility study will determine the continuation to the commitment to the development scheme. The expected return on investment comprises the key element for the realisation of this commitment in order to meet the requirements of the investors. The DCF stands as the most commonly used method in order to reach that estimate. Jaffe and Sirmans (2001) signify two basic criteria for the investment decision, the Net Present Value (NPV) and the Internal Rate of Return (IRR). Often both criteria lead to the same results but in certain cases critical differences exist.

Forecasting the potential cash flows constitutes the first step of the model. The variables that the DCF takes into account consist of two categories, cost and income related. Hence, cost and value uncertainty ought to be incorporated in the development process in order to output the final value of the project. This final value derives from a capitalisation process which converts all the future cost and income streams in current financial terms by using a discount rate. This is what is called NPV and actually comprise the difference between the benefits and costs of the project. The commitment to the investment occurs only when NPV equals or exceeds zero. (Jaffe and Sirmans, 2001)

The IRR is defined as the annual rate which equates the present value of costs and incomes or in other words it is the rate which equates NPV to zero. A clear link between these two decision rules exist which indicates that whenever NPV is greater than zero then IRR is larger than the discount rate and vice versa. Thus, both rules follow the same direction concerning the acceptance or the rejection of the investment. However, each criterion differentiates in the case of comparing two investment options due to size difference or different timing. For instance, an investment A might be found with a higher NPV while an investment B with higher IRR. As a result, a problem of profit optimisation arises during the comparative analysis of the two alternative projects. Nevertheless, NPV provides better assistance when wealth maximisation is the goal although many investors prefer to use IRR as a decision rule. (Jaffe and Sirmans, 2001)

Whatever decision model is adopted, the DCF method is highly dependent on the discount rate which accounts for both time value of money and the involved risks in the expected cash flows (IVSC, 2012). The determination of the discount rate is based on a number of assumptions concerning the opportunity cost of capital and basically coincides with the required rate of return (Geltner et al., 2007). A sensitivity analysis is embedded to the model in order to capture the uncertainty that derives from these assumptions. The role of sensitivity analysis is to investigate the impact that the variables of real estate development process have on the NPV, so as the developer will be able to weight the balance between risk and return (Cadman and Topping, 1995). The next section describes in more detail the process of managing uncertainty and risk.

### 3.3 Managing Uncertainty and Risk

So far the discussion about real estate development projects indicates a dynamic process with special characteristics such as specific geographical location and long life cycle. Thus, the developers have to deal with a unique risk management task (Graaskamp, 1981) in order to make the proper investment decisions. Risk management planning constitutes a holistic process which follows certain steps as it is illustrated in the Figure 3.3 This process aims at increasing the probability and impact of positive events and decrease the probability and impact of negative events in a project (PMBOK, 2001).



**Figure 3.3 Risk Management Plan (PMBOK, 2001; Frame, 2003; RICS, 2012)**

#### 3.3.1 Risk identification

Risk management plan begins with the identification of potential risks which may have an impact on the project. The distinction of the risk origin and its impact comprise a very

significant action at this phase. The techniques that are employed vary from formal procedures such as workshops with stakeholders, interviews, documentation reviews, and checklists to more informal practices like team discussions and brainstorming. All the above methods aim at utilising the experience of people in similar situations and thus minimise the potential of neglected risks. (RICS, 2012)

From the analysis of the real estate development process becomes clear that all the factors which insert uncertainty to the investment decisions and are associated with the financial outcome of the project are considered as risks. The sources of these risks derive from the different phases of the development process as well as the external environment. In that sense two broad categories of risks can be identified: internal (project) risks and external (general) risks.

**Table 3.1 Sources of Risk in Real Estate Development (drawn by the author based on various sources of literature review)**

<b>Political Risks</b> Industrial policy Housing regulation reform Land regulation reform Political activists Commercial tax policy Local tax policy Council approval Licence approving	<b>Economic Risks</b> Interest rates Land prices Market liquidity Inflation Demand and supply Sale prices and rents Capital exposure Tenants/buyers	<b>Social Risks</b> Workforce availability Income distribution Social mobility Education level Public interference Cultural compatibility
	<b>Project Risks</b> Unreliable or missing data Schedule due-dates and tightness Incomplete or improper design Cost estimation problems Resource planning problems Personnel motivation Project organisation Unsystematic project management Communication problems	
	<b>Environmental Risks</b> Adverse environmental impacts Climate change Waste disposal Energy consumption	
<b>Technological Risks</b> Site conditions Designers and constructors Constructability Duration Amendments Facilities management Tendering management Accessibility and Evacuation		<b>Legal Risks</b> Competition law Employment law Health and safety City planning Zone development

Nevertheless, risks can be classified into larger groups. For instance, Khumpaisal and Chen (2007) attempt to classify them into the following types: Social, Technological, Economic, Environmental and Political, also known as “STEEP” factors. Kang (2000) distinguishes the market and financial risks from the economic risks and also includes construction risks in his analysis. Sattarnusart (2012) recognises four groups of risks: Political, Social, Economical, and Technical. This study examines separately the factors which are inherent to the project and analyses its macro-environment using the PESTEL framework. The Table 3.1 presents an indicative example of different risks that can be included in these categories.

### **3.3.2 Risk Assessment**

After the identification of risks, risk assessment follows in order to comprehend the nature of the risk and quantify both the probability of occurrence and the possible impact. The first part of assessing the risks is covered by qualitative techniques which determine: the cause and the likelihood of its occurrence; in which stage the risk might appear; the influence in specific features and the projects as a whole as well as the correlation with other risks. The second part of risk assessment is conducted employing quantitative methods in order to provide arithmetical values for the various elements of risk. The latter includes the probability of occurrence ranging from 0 to 1 (0 = impossible, 1 = risk will occur) for all costs, the time schedule and the overall performance of the project. (RICS, 2012)

In the DCF model which it was explained earlier, the sensitivity analysis performs the assessment of risks which is reflected in the discount rate. In fact, it isolates each input variable and examines the variation of its value in order to determine the influence that exists in the overall output. Although this technique describes the assumptions behind the input variables and analyses the inherent risks, its approach remains highly deterministic without capturing the uncertainty of the cash flows explicitly (Jani et al., 2006).

In addition, the sensitivity analysis assesses the risks individually and it has no ability to correlate them; therefore, a modification of more than two parameters simultaneously can result in a deceivable outcome. Moreover, all the assumptions are made in advance before the actual construction begins. Hence, this removes the opportunity to insert any new features in the cash flow forecast during the development process and take into account its dynamic character. Finally, the estimation of the cost of capital that determines the discount rate requires the property value which comprises the object of the valuation (Jani et al., 2006).

In conclusion, the DCF model faces two major weaknesses which consist of an outcome of the challenges in estimating the potential cash flows and the discount rate (Triantis, 2003). The first one indicates the lack of flexibility to produce an output which includes all the possible scenarios about the values of the selected variables. Thus, the forecast is limited only to the most possible outcome without considering any alterations during the investment horizon. The second weakness pertains to the static approach concerning the timing of the discount rate estimation. The factors which determine this estimate fluctuate during the development process and even slight changes might cause huge inconsistencies to the final result.

For that reason, appraisers may employ more sophisticated tools such as Monte Carlo Simulation which can also be incorporated in the cash flows (D’Arcy et al., 2005; Jani et al., 2006). The advantage of the simulation is that provides a whole probability distribution

of the investment scenarios which inputs higher flexibility in the investment decision making. Monte Carlo simulation comprises one of the valuation methods that ROA uses in order to capture the uncertainty in property development more rigorously. The ROA will be elaborated in section 3.4.

### 3.3.3 Risk response

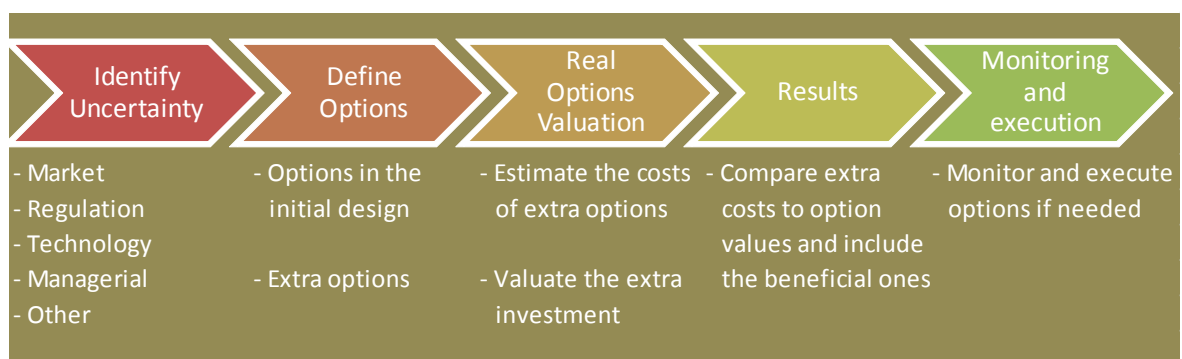
Risk response comprises the third step of the risk management plan and involves disparate actions in order to confront the identified and assessed risks. These actions include avoidance, mitigation, transfer and acceptance (Frame, 2003). Risk avoidance proposes a strategy to avoid a planned action when the probability of an unfavourable incident fluctuates in high levels or constitutes a certainty. Risk mitigation pertains to diminishing the probability and/or the impact of a risk. Risk transfer comprises a suggested action for a high level of risk through insurance, contract or warranty. Risk acceptance refers to that level of risk which can be tolerated by the developers, often risks with very low impact independently the probability of occurrence.

### 3.3.4 Risk Monitoring and Control

The last step of the risk management plan comprises the actual implementation of the risk response. Monitoring routines assist to update the process and identify potential deviations from the risk management plan (Frame, 2003). Furthermore, the costs of risk management actions ought to be taken into account very carefully before their implementation (RICS, 2012).

## 3.4 Real Option Analysis as an Alternative Valuation and Risk Management Method

Real estate development process includes disparate options concerning the progress and the final output of the scheme. The DCF method appears certain disadvantages in order to provide numerical values to such options limiting the capabilities of the investment decision making. The ROA provides the response to this encumbrance, as it inputs higher flexibility to the decisions of project managers by quantifying all the potential options of the development (Trigeorgis, 1995; Schwartz and Trigeorgis, 2001; Neufville, 2003; Triantis, 2003).



**Figure 3.4 Real Options Analysis Process (as adjusted by the author from Greden et al., 2005)**

The process begins with the identification of uncertainty and the definition of the existing options. The significance of this step is to highlight all the latent opportunities of the real estate development process. Subsequently, the valuation of these opportunities is conducted outputting the results which are monitored and executed according to the

circumstances of the micro and macro environment. The Figure 3.4 depicts the whole process. (Neufville, 2003; Greden et al., 2005)

### **3.4.1 General Background**

Real options framework consists of a body of theory and methodology for quantitatively evaluating options. The definition of an option, as it has been described in finance, pertains to the right without obligation to obtain something of value upon the payment or giving up something else of value (Geltner et al., 2007). In real estate development, the term “real options” refers to the analysis of options whose underlying assets are real assets as opposed to purely financial assets (Geltner et al., 2007). For example, a developer faces different potentials of profitability by land development; all the erected buildings on that land comprise physical capital.

Despite this difference, real options and financial options share some terminology (Barman and Nash, 2007). A call option is the right but not the obligation to purchase an underlying asset for a predetermined price (the “strike” price). A put option is the right but not the obligation to sell an underlying asset for a predetermined strike price. An American option can be exercised on or before its maturity date. A European option can only be exercised on its maturity date. A compound option is an option on an option. A rainbow option is any option that is exposed to more than one source of uncertainty.

A number of disparate types of real options can be found in the literature (Trigeorgis, 2001; Triantis, 2003; Barman and Nash, 2007; Lucious, 2001) classified in a different way. This classification is based on various characteristics such as the available flexibility to management, the project size, the project life and the timing or the project operation. The current study distinguishes the following six types of real options:

#### Option to defer

This option is also known as the option to wait before acting and refers to a situation of high uncertainty. In this case it might be wiser for the project decision maker to be in anticipation in order to protect the investment returns and gather useful information during the waiting time.

#### Option to stage

The option to stage regards the division of an investment plan into different phases in order to build a vertebrate project which can be monitored progressively. Thus, insights about the continuation of the project can be obtained and a potential abandonment can be examined if needed.

#### Option to alter

This option refers to flexibility of modifying the operation scale according to the market conditions. In the case of an unexpected economic flourish the project can be expanded or in the case of market recession the volume of investment activity can be deteriorated. Trigeorgis (2001) explains this option as a triple option: option to expand option to contract or scale down and option to shut down or restart.

#### Option to abandon

The delineation of an exit plan from the beginning of an investment initiative offers the flexibility to abandon the project before it causes any further losses.

#### Option to switch

The option to switch involves the potential modification of the value chain (i.e. production stages) or value network (i.e. suppliers, distribution channels, customers etc) of an enterprise.

#### Option to growth

Growth options include the sense of new investment opportunities that can broaden the operations of an entity.

Nevertheless, in real life the requirements of an investment project might be multi-dimensional and the adoption of more than one real option might be necessary. Trigeorgis (2001) sets a separate category for this combination calling it multiple interacting options and signifies that the aggregate effect may differ from the sum of the individual ones.

The value of the above identified options derives either from techniques that have been developed to evaluate financial assets or engineering models. These methods can be classified into four categories: partial differential equation approach, dynamic programming approach, simulation approach and hybrid methods which are based on simulation approach.

Black-Scholes comprise probably the most well known model of the first group. Another formula comes from Samuelson-McKean which provides a deeper application to land values (Geltner et al., 2007). The binominal model belongs to the second valuation type and constitutes a discrete decision model. Monte Carlo simulation derives from a more engineering approach (the previous ones have an economic theory background) whose analysis incorporates the uncertainties in input variables. Masunaga (2007) performs a comparative analysis of these methods.

Furthermore, two more recent additions were developed by Datar-Mathews (2004) and Collan (2009) which form the most characteristic examples of the hybrid methods. The first one uses Monte Carlo simulation in order to produce a pay-off distribution while the second, based on the first, deploys fuzzy numbers instead of probabilities. This fuzzy logic can be considered as superior due to the formalisation of the inaccuracy that exists in human decision making (Collan, 2011).

#### **3.4.2 Application to real estate development**

Often developers face unfavourable conditions while they aim to develop the land they own. This can be related to any of the risk factors that have been identified earlier in the discussion of the investment decisions in real estate development. For example, if the planning authorities permit the use of land for commercial purposes and the demand of residential properties is soaring, then the opportunity cost of commencing such a project is relatively high. In that case, if the developer will wait, in order to enforce the best potential use of the land, he may expect higher returns on his investment. Therefore, the value of vacant land should enclose both the value of its immediate use as well as the value of the option to defer (Trigeorgis, 2001).

Rocha et al. (2007) highlight the significance of the option to stage in a residential project in Rio de Janeiro as a tool of risk diversification. In particular, they build a decision tree of which each branch represents a different phase where the developer monitors the success or the failure of the project. A successful monitoring underpins the progression of the project while the failure activates the option to wait for further investigation or the option



to abandon. The latter also comprises a typical example of a real option in real estate development, where the residual price determines its value. In addition, the option to alter exists with the form of expansion or contraction if the market conditions are propitious.

Furthermore, the option to switch can be applied in a real estate project either referring to the value chain or to the value network. In the first case, a change in the inputs configuration (e.g. construction materials) might occur aiming at cost savings. Additionally, very often developers convert the land use into a different mode which affects both the output mix and the customer target group as a part of the value network. Barman and Nash (2007) present such an example of altering an office building to residential. Moreover, a certain arrangement of the value chain can be useful for future projects establishing a growth option for the whole development company (Lu, 2007).

Despite the contribution of the ROA in the above cases it has met low recognition by the professionals of real estate and construction sector. Geltner and de Neufville (2012) argue that this occurs mainly due to two major weaknesses of the method. The first one refers to the challenges of quantifying the input variables of the model which derive from the volatility of their values. Although this barrier can be overcome in the financial markets, the lack of empirical data on real estate prices poses certain difficulties in estimating the historical volatility of such assets. The second weakness on one hand refers to the complex mathematical calculations which are required and on the other to the over simplicity for modelling particular investment decisions. Any attempt to address these issues leads to the lessening of the robustness of the analysis.

Therefore, a trade-off exists between the level of rigor and the clarity of real options models. As real estate development is influenced by a wide range of factors, capturing all of them in the risk analysis it increases the grade of complexity and makes the whole process hard to be understood by the decision makers (Copeland, 2010; Kit So, 2013). In addition, property development companies operate within a market where other players exist and thus the delineation of the investment strategy also relies on the competition that is created. The ROA provides limited solutions in this encumbrance and for this reason the combination of real options and game theory is examined (Copeland, 2010; Kit So, 2013).

## **4 Urban Regeneration as an Investment Process**

This chapter combines the theoretical framework of urban regeneration and real estate development from the previous chapters and elaborates urban regeneration as an investment process. The interdependence of urban policy and the real estate market outline the necessity of collaboration between public and private sector in order to manage the risks and uncertainties involved in developing urban regeneration projects (Karadimitriou et al., 2013). The commitment of various stakeholders to such schemes denotes different roles and goals which sometimes may lead to a conflict. Nevertheless the overall aim is to create value through social and spatial transformations. The distribution of this value comprises the main concern of each party involved which is reflected in the intense negotiations about the amelioration of uncertainty and allocation of risks (Karadimitriou et al., 2013).

Before analysing the procedure of identifying the opportunities that optimise the returns of developers, it is crucial to place real estate development within an urban regeneration context. This context creates a framework which includes certain limitations but simultaneously provides certain opportunities to the developers. Thus, the chapter begins with the introduction of the context, content and organisation of urban regeneration projects.

Beside this contextual framework, financing and the associated risks comprise a great challenge throughout the urban regeneration process. As it has been discussed in the second chapter, the participation of the private sector in urban regeneration schemes seems somehow contradictory. Subsequently, the third sub-unit of the chapter explores the investment opportunities which derive from urban regeneration as mixed-use development projects. The fourth section examines how the valuation and risk management techniques borrowed from real estate development can provide accurate estimates for the project value.

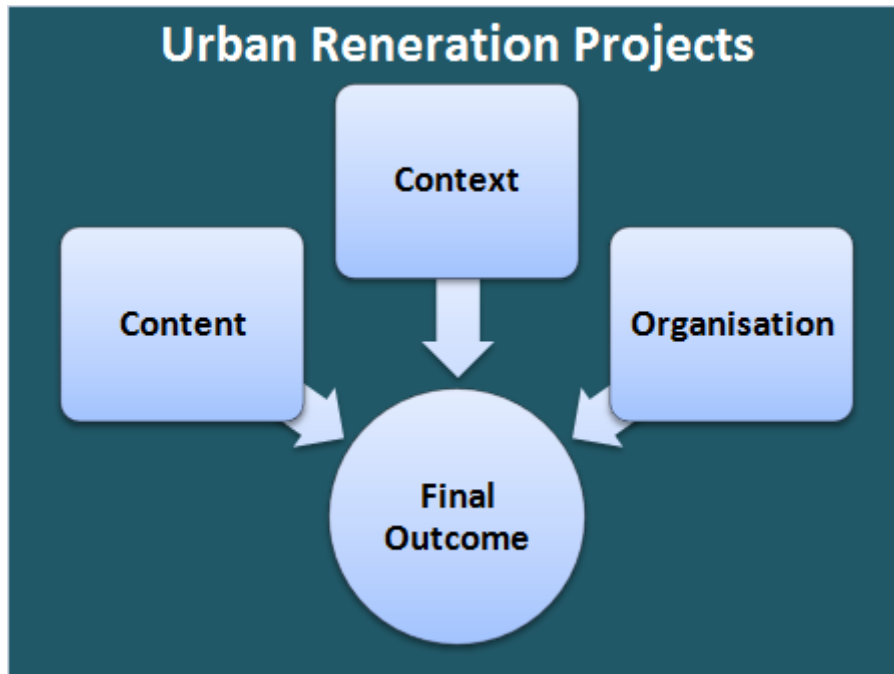
### **4.1 The Content, Context and Organisation of Urban Regeneration Projects**

As in real estate development, urban regeneration projects involve a wide range of actors and resources which compose the final outcome. However, the polymorphic nature of urban regeneration schemes creates different objectives on behalf of each stakeholder who aim at diverse action plans. The convergence of these plans with the parallel overcoming of any resources constraints defines the content of the project (Karadimitriou et al., 2013). A strategic vision and framework appears necessary for this convergence to be achieved (Carter, 2000; Lichfield, 2000).

In addition, the organisation and coordination of the various actors as well as the good management of resources also influence the above content. A clear allocation of responsibilities makes the partnership more effective and utilises the available time and resources to the maximum (Carter, 2000). This allocation determines the distribution of property rights which affect the leverage of each party and hence the whole organisation of the regeneration process (der Krabben and Needham, 2008; Karadimitriou et al., 2013).

Yet, urban regeneration comprises a long lasting process within an economic, social, physical, environmental, and institutional context (Roberts, 2000; Carter, 2000; Karadimitriou et al., 2013). All these spheres interact with each other affecting

simultaneously the progress of urban regeneration process. Consequently, the planning of the project has to be aligned with the local and regional conditions as well as gain the support of the agencies involved respectively (Carter, 2000). The following figure illustrates the linkage of these disparate features of urban regeneration projects. As urban regeneration is a dynamic process, likewise these features are subject to changes throughout the whole lifecycle of the project.



**Figure 4.1 The Three Core Elements of Urban Regeneration Projects (Karadimitriou et al., 2013)**

As a result, the success of urban regeneration schemes depends on a holistic approach which includes all the above core elements. The successful examples that have been mentioned earlier, such as Baltimore, Barcelona or Bilbao, established well coordinated partnerships between local authorities and various private organizations. Falk (2004) signifies a four stage process that these kinds of partnerships follow; these stages are vision, phased strategy, orchestration of investment, and maintenance of momentum.

A strategic vision engages the disparate stakeholders to the partnership and creates the circumstances to identify the strengths and the opportunities that others have missed (Falk, 2004). Hence, this vision provides the required uniqueness of the project avoiding the pitfall of imitation. The phased strategy refers to the time consuming process of urban regeneration and the management of the investment cycle. Regeneration schemes should be divided into smaller scale pilot projects and be embraced by an emblematic one that will play the role of the trademark (Falk, 2004). Thus, developers can monitor the signals from the external environment before they market the project as a whole.

The orchestration of investment pertains to the forms of partnership and the acquirement of necessary financing. Carter (2000) and Trache et al. (2007) reproduce a typology of PPP in urban regeneration which was initially introduced by Mackintosh in 1992. In particular, Mackintosh denotes three models of partnership, the synergy, the budget and the transformational one. The synergy model highlights the power of an alliance and its

superior outcome compared to the results derived from the combination of its disparate features. The budget model relies mainly on the financial aspect of the partnership while the last one suggests an ongoing innovation process with mutual exchange of knowledge among the partners.

Finally, time plays a significant role in urban regeneration as it implies a long-term investment capable of reconfiguring the structure of the scheme. This increases the already high complexity due to the involvement of various actors in the development process. Therefore, the capacity of those actors to adapt to the circumstances and maintain the momentum of the investment is considered as very crucial. In addition Adair et al. (2001) and Graaskamp (1981) denote time as a significant factor which exposes the project to higher interest rate risk.

## **4.2 The Financing of Urban Regeneration**

Funding comprise the next step after the delineation of the regeneration strategy according to its three core elements. Often such projects require a significant upfront investment in order to enhance the development potential and afterwards a capital injection to retain the momentum within the economic and property market cycles (Adair et al., 2000; Karadimitriou et al., 2013). In addition, the actual structure of this funding determines the viability of the schemes and its risk/return profile (Adair et al., 2000; Karadimitriou et al., 2013). The sources of finance vary according to the characteristics of each project, the local property market performance and wider macro-economic criteria (Adair et al., 2000). However, private finance constitutes the most common source using debt as a principal method despite the perception of the high riskiness of urban regeneration (Adair et al., 2000).

The public authorities have the main responsibility to facilitate the private initiatives which aspire to urban regeneration and local development. Such actions provide those incentives to developers and investors that mitigate the risks of a market failure and hence foster their participation in urban regeneration schemes. This market failure or success consists of many drivers such as the required demand; the leadership role of public investment; the provided certainty by the planning framework; the location of the site; the direct access to decision makers or good phasing of different projects (Trache et al., 2007). The public sector possesses a variety of instruments in order to spur the confidence of private sector which have financial, administrative or legislative character.

Taxation comprises a typical financial mechanism in order to assure the commitment of the private sector. However, when such a mechanism constitutes the sole motivation then it is condemned to fail, as in the case of the EZs in the UK (Adair et al., 2000). Furthermore, during the 1990's the British urban policy developed more flexible funding strategies through the City Challenge, the EPs, and the SRB. These programmes include gap funding, loans, loans and rental guarantees, and finance for joint ventures (McGreal et al., 2000).

Also, the Private Finance Initiative (PFI) comprise another mechanism to promote partnership although it was not exercised in a large extend in urban regeneration projects. The main focus of PFI includes the encouragement of capital investments into public projects providing value for money and transferring the risks to the private sector whenever possible (Dubben and Williams, 2009). Simultaneously, the European funds gain increased role as a financial support mechanism.

In a similar vein Caschili et al. (2011) examine the application of innovative financial mechanisms in Brownfield sites around the world. Local authorities draw programmes that provide several types of incentives such as regulatory or liability relief, various grants, loans, subsidised insurance, waivers of development fees, property tax abatements, and remediation tax credits. In addition the central government sets the eligibility criteria for the candidate private actors posing certain restrictions for the usage of the funds. The overall aims of such initiatives include: reducing the risks on the lender site, reducing the financing costs of the borrower, enhancing the financial situation of the borrower and providing direct financial assistant.

From the administrative and legislative aspects of policy instruments, bureaucracy stands as a significant factor that has to be reduced by simplifying the investment procedure to the maximum. Furthermore, private investors consider continuity of the regeneration scheme accompanied by a master plan as a crucial issue. This denotes the required commitment of the public sector which assures leveraging of the private investment and cultivates an environment of confidence. Similarly, Compulsory Purchase Order (CPO) facilitates land assembling which overcomes the barriers raised by fragmentation of land ownership. (Adair et al., 2000)

In relation to the role of the public sector, McGreal et al. (2000) and Adair et al. (2002) conducted a survey concerning the investment drivers of the private sector in urban regeneration schemes in the UK. The survey includes both investors and non-investors perspectives and outputs the total return and the alleviation of risks as the greatest motives. Among other factors the participants highlighted new business opportunities, availability of an exit strategy, track record in urban regeneration, relationship with regeneration agencies, company image, social reasons and competitor behaviour.

On the other hand, the reasons for avoiding investments in urban regeneration include low rental and capital growth rates, low quality of neighbouring environment, insufficient grant regimes, high bureaucracy, inflation of construction and land costs, inadequate tax breaks, insufficient land assembly, ineffective structure of partnerships and facilitating arrangements, and poor quality of labour force. The above findings are summarised in the following table.

**Table 4.1 Motives for Investment and Non-Investment in Urban Regeneration (McGreal et al., 2000; Adair et al., 2002)**

Factors for Urban Regeneration	
Investment	Non-Investment
Total return	Low rental and capital growth rates
Alleviation of risks	Low quality of neighbouring environment
New business opportunities	Insufficient grant regimes
Availability of an exit strategy	High bureaucracy
Track record in urban regeneration	Inflation of construction and land costs
Relationship with regeneration agencies	Inadequate tax breaks
Company image	Insufficient land assembly
Social reasons	Ineffective structure of partnerships and facilitating arrangements
Competitor behaviour	Poor quality of labour force

In addition, two other surveys conducted in six European cities and Paris (Trache and Green, 2001; Nappi-Choulet, 2006) underpin the above primary influential factor of required rate of return as the most significant one. Also, Trache and Green (2001) denote three non-financial issues which are fundamental to private sector participation: information, capital constraints and market trends.

In conclusion, the participation of the private sector in urban regeneration schemes highly relies on the provided incentives from the public authorities. D'Arcy and Keogh (1997) highlight the significance of this participation using examples from various European cities. Furthermore, Adair et al. (2000) argue that the direction of urban policy should move to more sophisticated and flexible vehicles which will maximise the private sector involvement. These vehicles should cultivate a more secure investment environment for developers and investors with alternative solutions for risk diversification.

### **4.3 Land Uses and Investment Opportunities**

The identification of investment opportunities requires a thorough market research which outputs the trends of the demand in order to draw an investment plan that covers its needs. The demand can be interpreted in terms of land uses meaning that the developers have to select these uses of land which are capable of optimising their profitability. However, in an urban regeneration context many restrictions exist and various issues have to be considered. Over the last decades, policy makers move to the direction of mixed-use development promoting a compact city model. This model attempts to avoid urban sprawl, traffic congestion, the pollution of the environment as well as to spur economic, social and cultural diversity (Coupland, 1997; Foord, 2010; Herndon, 2011).

Despite the difficulty to define and conceptualise mixed-use development, it is generally accepted that this term is based on three basic axes: consists of multiple and integrated uses capable of attracting their own markets; space maximisation and intensive land use; all features of the project comply with a coherent plan (Herndon, 2011). Although the first axe refers to multiple land uses, Foord (2010) in his research denotes a dual mix of housing and office development as the most common combination.

Compatibility of uses arises as the major issue of such development schemes with activities that complement each other and create attracting living locations. Furthermore, the integration of land uses with the surrounding area supplements the attractiveness of the projects. This attractiveness also depends on the accessibility of the location indicated by the available infrastructure. Finally, the exploitation of special features, such as waterfront locations, or the usage of the existing buildings increases the functionality and reckons the uniqueness of the project. The combination of the above factors comprises the key of success and contributes to the enhancement of the identity and image of the whole city. (Coupland, 1997; Falk, 2004; Foord, 2010; Herndon, 2011)

However, in practice the above success factors often fail to capture spherically the distribution of benefits. Foord (2010) investigates the spatial dimension of mixed-use diversity and vitality as well as examines the general perception of residents and workers about this mixed-use environment. The first scale of his research outputs that the street level of the development determines the degrees of diversity and vitality. The second scale, among other findings, denotes that mixed-use development schemes appear more beneficial for the businesses which are located there rather than the residents.

The latter finding derives as a result of the indicative tolerance that residents show mainly due to the permeability of the area while this comprises a great motivation for the location of enterprises. In addition, the high density of such projects might have no impact to the commuting of residents as they work and spend their leisure time in other areas. Therefore, the implicit trade off between the different land-uses has to be addressed so as the appropriate balance will be achieved.

In terms of investment, mixed-use development constitutes a good method for the developers to allocate the market risk more effectively between the different land uses. On the other hand, this increases the management costs and the complexity of the design. Moreover, it might pose conflicts between the disparate users of the space. Beside this, multiple-use projects can increment the vacancy risk as many investors prefer single-use estates occupied by a single tenant with strong covenant that guarantees a stable rental income.

All in all, developers evaluate the investment opportunities of urban regeneration projects according to their performance. The increased complexity of such schemes, the high construction costs as well as the great uncertainty about the rental and capital growth classify urban regeneration among the secondary investments (Marsh, 1997). Nevertheless, Adair et al. (2005) argue that the rental growth in regeneration locations can be compared to prime market. In particular, as a regeneration area becomes established, rent values rise which spurs the investment interest and hence increased competition and shortening of yields emerge.

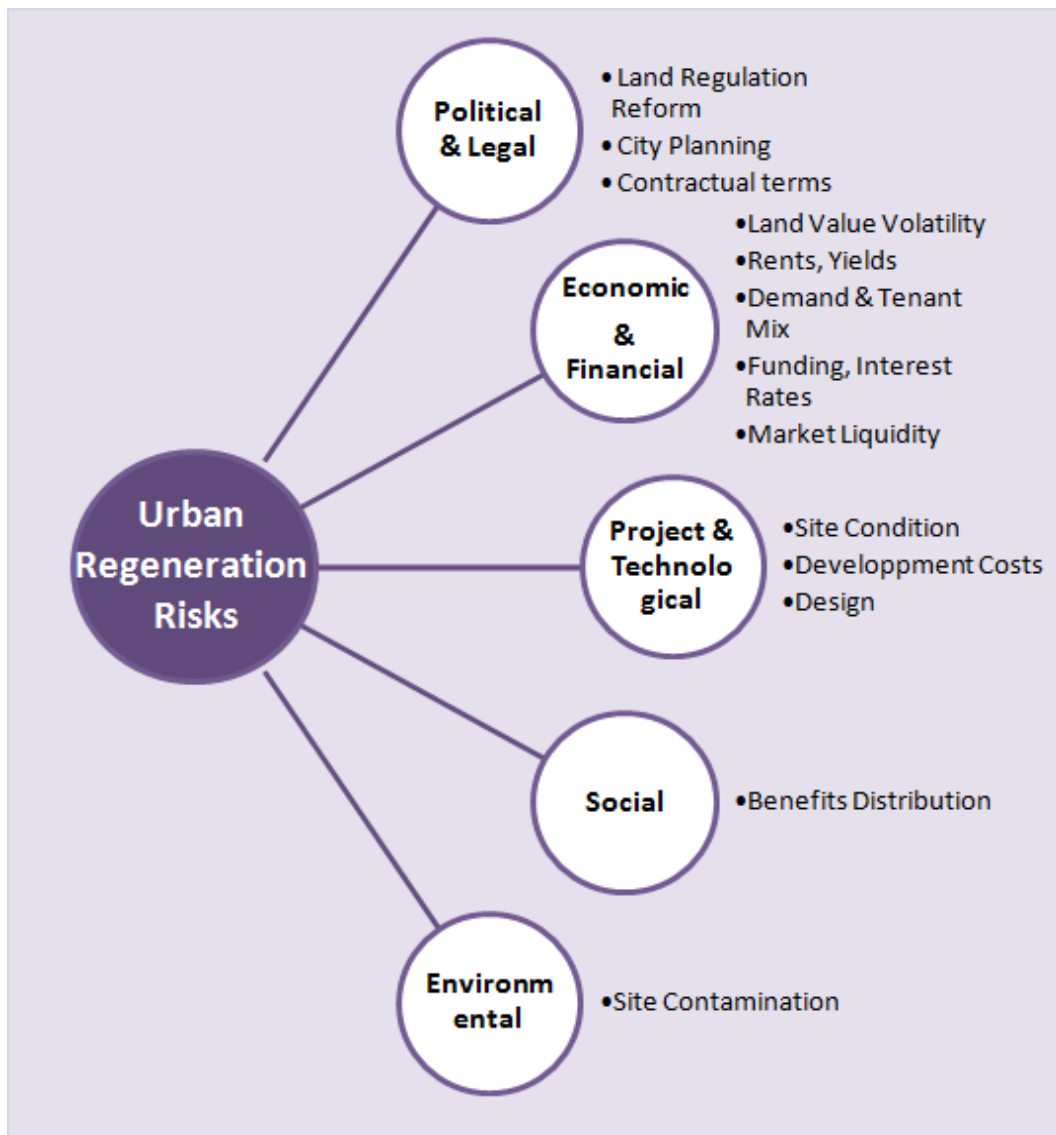
## **4.4 Valuation of Urban Regeneration Projects**

### **4.4.1 Input variables and inherent uncertainty**

The previous sections highlighted the main parameters which should be taken into account when conducting the investment analysis of urban regeneration schemes. These factors are input in the formulas of the employed models and the reflection of their inherent uncertainty constitutes the key for the delineation of a successful investment plan. The Figure 4.2 depicts the inputs which comprise the main sources of risk in the project.

The vast majority of the existing literature highlights contamination as the prime risk that repels investors from urban regeneration schemes. Contaminated areas include higher development costs due to remediation and great challenges concerning the positioning of the redevelopment project in the market. In other words, derelict industrial sites are stigmatised from the public, entailing liability claims owing to exposure to contaminant substances, decreasing thus the project value (Meyer and VanLandingham, 2000; Adair et al., 2001; Bond et al., 2001; Jackson, 2001).

Furthermore, statutory procedures concerning land regulation reform and city planning stir an uncertain climate. As mentioned earlier, compatibility of land uses plays a significant role in the investment appraisal. Also the location attributes which pertain to existing infrastructure determine the level of the redevelopment difficulty. As a result, obtaining the planning permission as well as its timing can confirm or void the initial assumptions of the feasibility study (Adair et al, 2001). In addition, the formation of partnerships raises the issue of complex contractual agreements which may have a significant impact to the final outcome.



**Figure 4.2 Prime Sources of Risk in Urban Regeneration Projects (drawn by the author based on Meyer and VanLandingham, 2000; Adair et al., 2001; Bond et al., 2001; Jackson, 2001)**

In addition, a number of economic and financial factors influence the exposure to risks; Adair et al. (2001) underpin the volatility of land prices as the greatest one. Beside this, rents and yields reflect the level of demand which ensures a certain level of revenue. A good tenant mix with strong covenant can reduce the possibility of financial failure. Furthermore, property markets are subject to specific limitations such as slow disposal of land which results in market illiquidity. Project financing comprises another significant issue and as it has been argued in the 4.2 sub-unit often urban regeneration lacks investment capital. In relation to the particular time consuming process any possible delays expose the project to higher interest rate risk.

Moreover, a good project design enhances its attractiveness and establishes the foundation for its marketability and remarkable financial returns. In addition, the initial condition of the site has to be taken into account addressing potential replacement or re-adaptation of buildings, remedial works and inconvenient access (Adair et al., 2001). Also, solid social



benefits contribute significantly in the success of urban regeneration but monetary profit always constitutes a priority for the developers (Adair et al., 2001). Finally, besides all these factors discussed above, the scarcity of reliable data on regeneration projects poses severe constraints on the available information and lack of transparency (Adair et al., 2001).

#### **4.4.2 Assessment of input variables and uncertainty**

As denoted in chapter 3, the DCF model prevails among a variety of other methods in order to estimate the profitability of a project. The model is supplemented by a sensitivity analysis in order to capture the uncertainty of the input variables. This analysis always leads to a higher risk premium and hence to a risk adjusted discount rate in order to confront the exceptional risk of urban regeneration compared to Greenfield development (Adair et al., 2000&2001; Jackson, 2001). However, the increased level of the discount rate relies mostly on the intuition of the managers or on a market sentiment. Although the impact of each risk factor is defined quite accurately the lack of correlation provides an implicit overview of the existing uncertainty.

Moreover, Meyer and VanLandingham (2000) signify the critical issue of double counting the risk as a result of increasing the discount rate and the simultaneous subtraction of costs from the income streams due to e.g. environmental factors. In addition, the definition of the parameters which determine the discount rate occurs at the inception phase with no ability to be modified in the subsequent phases. Therefore, the DCF tends to overestimate the value of uncertainty and underestimate the value of the project. Consequently, the managers might miss latent investment opportunities which could strengthen the vision of the scheme and avoid imitation.

Nevertheless, the developers follow the recommendation of Falk (2004) and adopt a phased strategy for the development process. This phased strategy reduces the complexity of the project and provides the ability to manage risks more effectively. However, staging the process by using the DCF model outputs different cash flows and project values for each sub-project. In other words, there is no unified result for the scheme, as a whole, but disparate values from the smaller parts. Therefore, the appraiser attempts to estimate the final value of the project based on the indications of each separate cash flow.

On the other hand, the ROA quantifies all the identified options and computes disparate scenarios over the lifecycle of the project with no need to adjust the discount rate. This enables the decision makers to have better insights on the investment process and conclude to the most optimal solution. In particular, managers monitor the results of ROA and determine the exercise of any option that derives from the delineated scenarios. Wang et al. (2009) describes this process as a Decision Support System (DSS) which provides investment advice of higher quality. As he argues, DSS apart from the disparate potential project values produces an optimised strategy for dealing with uncertainty.

Geltner and de Neufville (2012) apply real options valuation with Monte Carlo simulation in New Songdo City (NSC) in Korea, a large scale urban development project. The planning of the project starts with the option to stage attempting to identify the optimal number of phases (two scenarios are examined: a two-phased and a six-phased development). Thereafter the question of timing arises, examining potential delays or even an exit plan (option to abandon). The simulation outputs different development time schedules according to the number of phases as well as a distribution of disparate NPVs. The mean project values of the real options scenarios are higher than the NPV which

derives from the base scenario of the traditional DCF model. Thus, the incorporation of higher flexibility in the investment analysis increases the value of the project as it recognises latent opportunities.

In addition, Wang (2011) examines the implementation of fuzzy real options in a Brownfield redevelopment project focusing on remediation costs which comprise one of the main sources of risk. In particular, he distinguishes the development costs to remediation and redevelopment and stages the project into three phases, before remediation, after remediation and after redevelopment. Furthermore, Wang examines the timing of the scheme by identifying three scenarios, to take no action, remediate and redevelop subsequently, and remediate and redevelop simultaneously. According to this model, Wang implies two main real options, the option to wait and the option to stage as in the case of NSC in Korea. The option to abandon depends on the liability of the land owner regarding the remediation costs and it can be replaced with the option to remove and redevelop.

The optimal decision that derives from his analysis suggests waiting and developing simultaneously at a later stage. Apart from the NPV of the project, this fuzzy methodology quantifies the managerial flexibility of waiting for more favourable market conditions. Although the option to wait and stage provide the opportunity to monitor these market conditions, urban regeneration has such a long term horizon that even these options might not include the required flexibility. Thus, the employment of the option to switch seems necessary so as to ameliorate any alterations of the market in the far future. Nevertheless, Wang (2011) does not neglect this option completely as according to the model of Lentz and Tse the option to switch comprise an option which is identified on the basis of another option.

All in all, the dynamic character of urban regeneration process increases both the level of uncertainty and the complexity of the investment analysis. On one hand the DCF model lacks the required flexibility in order to capture the inherent uncertainty in the regeneration schemes. On the other hand, the ROA contributes significantly to deal with this encumbrance at the expense of simplicity. Therefore, the selection of the method involves a trade-off between the rigor of the analysis and the opacity of the results.

#### **4.5 Conclusions on Literature Review**

Urban regeneration comprises a multidimensional concept which derives from urban change and the evolution of urban policy. Property development appears as an integral part of this concept since the first appearance of large scale UDPs. This constitutes strong evidence concerning the involvement of real estate development in urban regeneration. UDPs have a form of mixed-use redevelopment which undertakes the responsibility to revitalise the physical environment and produce economic and social value with respect to the environment. Therefore, the direction towards a sustainable outcome comprises the main goal.

The theoretical background of real estate development can explain at some extend urban regeneration process and provide useful tools for its evaluation as an investment. The major difference between these two processes originates from the multi-disciplinary structure of urban regeneration schemes. Thus, a thorough strategic framework is needed in order to manage the organisation of these schemes and determine their goals. In addition,

the external environment in terms of economic and property market cycle creates an uncertain climate for such large investments.

This uncertainty reflects the great concern of the private sector about their total returns and the alleviation of risks. The management of risks involves both the responsibilities of the public sector and the employment of solid techniques on behalf of the developers. The role of the public authorities includes the transformation of unattractive areas to desirable locations to invest. This can be achieved by providing the appropriate incentives to developers and investors that alleviate the risks and enhances the value of the project.

The appraisal of the project value is currently conducted by the DCF model and the embedded sensitivity analysis which are considered as static and questionable. Additionally, Adair et al. (2000) denote the necessity to develop more solid valuation methods that enhance risk management in order to increase the participation of the private sector in urban regeneration schemes. Therefore, the ROA covers a certain part of this gap acting as a supplement to the intention of the public sector to leverage private investments.

In the view of multiple options during the urban regeneration process, the application of the ROA seems intuitively apparent (Lucious, 2001). The ROA identifies the latent opportunities and quantifies the disparate options of urban regeneration increasing the value of the project. However, the lack of empirical data poses certain challenges in the calculation of the volatility of the input variables. Moreover, the examination of specific options like the one to switch has found limited manifestation in the literature as well as the competition is not considered during the investment analysis. Furthermore, the presentation of real options results is considered quite complicated, confusing in a large extend the developers. As a result, despite the quick adoption of real options way of thinking, the implementation of rigorous real option valuation techniques occur at a slower pace (Triantis, 2003).

## **PART III – Empirical Study**

### **5 Preparation and Implementation of the Case Study**

#### **5.1 Research Design and Data Collection**

As it has been mentioned in Part I the case study consists of five components where the first two, the research questions and propositions have already been presented. The unit of analysis derives from the actors of urban regeneration in Helsinki region and in particular concentrates on the processes that these actors use in order to analyse the emerging investment opportunities. Therefore, the current study adopts a single-case design embedding the disparate urban regeneration projects of Helsinki region.

According to Yin (2013) three major rationales exist for the selection of single-case design: when the case represents a critical case in testing a well-formulated theory; when the case represents an extreme or a unique case; when the case is revelatory e.g. the researcher has the opportunity to observe and analyse a phenomenon which previously was inaccessible in the research community. Beside the above reasons, a single case study can spur further research on the subject and constitute the first of a multiple-case study.

The case of HMA comprises a critical case study in terms of investigating the investment opportunities within the urban regeneration process of a burgeoning metropolitan area, based on the paradigm of well-established metropolises such as London or Paris. As it derives from the literature review, the British and French cities have a long tradition in urban regeneration and in the case of London and Paris they constitute the largest urban regions in Europe. The comparative small size of Helsinki which has great potential for growth within the next twenty to thirty years makes HMA an interesting case study. In addition, the case of regeneration of Helsinki may initiate a wider research about flourishing urban centres in Europe or in other parts of the world, especially for those which are consequently ranked amongst the most liveable cities of the world (see Economist Intelligence Unit, 2013).

Interviews are one of the most significant sources of information for case studies (Yin, 2013) that provide the opportunity to understand more thoroughly the behaviour of the unit of analysis and hence lead to perceived causal conclusions (Seidman, 2012; Yin, 2013). The different types of interview vary according to the looseness of its structure, moving from completely open-ended structure to a strict one which sometimes may resemble a survey (Harrell and Bradley, 2009). This thesis adopts a semi-structured methodology aiming at creating a dialogue between the researcher and the interviewee, and thus utilise his/hers useful insights and experience to the maximum. Additionally, a proportion of the collected data derives from disparate documents provided by the interviewees and public authorities.

The quality of the interviews comprised the main priority and thus their duration varied between sixty and ninety minutes following the same pattern in the beginning but continuing randomly towards the end so as to provide the required freedom to the interviewee. The interviews were conducted in person and individually with only one exception, where an interviewee requested the presence of a colleague; this results in a number of ten interviews and eleven interviewees. In most of the cases the questions/topics of discussion were requested in advance and further clarifications were provided whenever it was necessary. The respondents consist of both real estate developers and

investors, and hence a slight rephrasing occurred due to the difference of the perspective. Nevertheless, this had no influence to the essence of the questions and the general concept of the conversation.

## **5.2 Selection of the Case Companies**

As the scope of the thesis mainly focuses on the perspective of real estate developers, real estate development companies constitute the major source of information. Helsinki property development market is dominated by a few large construction companies which are originated either from Finland or Sweden. These companies undertake the majority of urban development projects in the region including Skanska and NCC from Sweden as well as YIT, SRV and Leminkäinen from Finland. In addition, Newsec is a consulting company which provides property development services to the construction companies or real estate investors and thus it is also included in the selected companies.

Although this makes a homogeneous sample, as it is defined by Ritchie et al. (2013), the size of it is considered rather small. Therefore, a few companies from the side of real estate investors were employed as a supplement, also in order to capture their perspective concerning their participation in urban regeneration process. The selection of the real estate investment companies was made through the snowball or chain sampling, i.e. each interviewee recommends another participant to the researcher (Harrell and Bradley, 2009). The rationale of selecting this sampling method is to denote those investors who actually get involved in urban regeneration projects. These investors include Renor, LocalTapiola Real Estate Asset Management Ltd, and Pohjola Property Management Ltd.

From the above companies ten interviews were conducted, one person per company, two for LocalTapiola simultaneously, and two people from YIT. All the interviewees hold senior positions in their companies. The profiles of each company are presented below and their involvement with urban regeneration projects is explained:

Skanska (<http://www.group.skanska.com/>)

Skanska is one of the leading construction and project development groups of the world concentrated on selected home markets in Scandinavia, the rest of Europe and in the U.S. Its main operations consist of construction, development of residential and commercial property, infrastructure as well as private-public partnerships. In Finland, the combined sales from its operations in 2013 were approximately 798 million euro and the company employed about 2,190 people. These operations include major urban development projects such as the Shopping Centre Puuvilla in Satakunta region or the Technopolis office complex in Kuopio. The upcoming projects in HMA comprise the Kivistö City Centre, 6km away from the Vantaa airport and Telakkaranta project as a part of the wider West Harbour regeneration.

NCC (<http://www.ncc.fi/en/>)

NCC is one of the leading construction and property development companies in the Nordic region providing sustainable solutions for residential, commercial, industrial and public buildings as well as various types of infrastructure. Furthermore, the services of the company include input materials used in construction and it also operates in the Baltic region, Russia and Germany developing housing. The consolidated sales of the group in 2013 reached 58 billion SEK and employed 18,500 people. In Finland, NCC concentrates its main development projects in Espoo and Vantaa participating in the wide area

regeneration of Kivistö City Centre. In the city of Helsinki Aitio Business Park is under construction and the redevelopment of a red brick block in Vallila is coming in 2016.

YIT (<http://www.yitgroup.com/>)

YIT is the largest residential construction company in Finland and the largest foreign residential construction company in Russia. It also builds housing in the Baltic countries as well as in Central Eastern Europe. Besides residential buildings, the operations of YIT include business premises and infrastructure and its shares are listed on NASDAQ OMX Helsinki. In 2013 the revenue of the company reached approximately 1.9 billion euro and employed more than 6,000 employees. Tripla comprises the major urban development scheme of the company which refers to the regeneration of Pasila, one of the key locations in Helsinki.

SRV (<https://www.srv.fi/en>)

SRV Group Plc is a publicly listed construction and property development company which operates in Finland, Estonia, St. Petersburg and Moscow. In Finland, SRV develops and builds residential, retail, and office premises, logistic centres, hotels as well as undertakes infrastructure construction projects. The project list of the company includes Kamppi Centre which comprises a significant regeneration of Helsinki CBD. Currently, SRV is planning a mixed-use scheme for the redevelopment of Kalasatama centre in Helsinki.

Lemminkäinen (<http://www.lemminkainen.com/>)

Lemminkäinen is a leading Finnish construction company specialising in infrastructure and different types of buildings as well as in private-public partnerships. Its operations focus on the Northern European markets such as the Nordic and Baltic region. The shares of the company are listed on NASDAQ OMX Helsinki, its net sales reached 2 billion euro in 2013 and employed an average of 6,000 people. The reference list of Lemminkäinen includes many regeneration projects such as the Lifecycle Centre in Kuopio, the Kastelli project in Oulu, and the Töölölahti area in Helsinki.

Renor (<http://www.renor.fi/en>)

Renor is a Finnish privately owned real estate development and investment company which specialises in owning, developing and leasing old, usually industrial, properties in southern Finland. The market value of the portfolio of the company reached 168 million euro in the end of 2013 and it had a personnel of 34 people. The portfolio of Renor consists of significant regeneration projects such as the Asko area in Lahti, and the Puuvilla centre in Pori. In HMA, the company owns three properties of which the historical old silk mill in Tikkurila (Tikkurilan Silkki) comprises the highlight from a regeneration perspective.

LocalTapiola Real Estate Asset Management Ltd (

The company operates as a part of LocalTapiola Group which consists of 20 regional companies in Finland, in the banking, insurance and the wider financial sector. LocalTapiola Real Estate Asset Management Ltd. provides real estate investment and management services with a portfolio that reached 3.2 million euro in 2013 and 45 professionals as personnel. Currently, the company invests in the AINO project as a part of the regeneration of Tapiola centre in Espoo and in REDI shopping mall which comprises a part of the regeneration of the Kalasatama area in Helsinki.

Pohjola Property Management Ltd (<https://www.pohjola.fi/en>)

The company comprises a part of the Finnish Pohjola financial services group which operates through three business segments, banking, non-life insurance, and asset management. Its services include real estate investments, leasing as well as property management and development. Pohjola Property Management Ltd. invests in REDI shopping mall in Kalasatama project.

Newsec (<http://www.newsec.com/#>)

Newsec comprises the largest specialised commercial property company in Northern Europe and covers all aspects of commercial real estate for its clients, owners, investors and corporations. In Finland, Newsec is the only consulting firm which provides property development services that include shopping centres and mixed-use schemes, portfolio development analysis and strategy as well as project planning and budgeting. Yet, the company appears no involvement in the major urban development projects of HMA but its expertise and long experience provide useful insights for the local real estate market.

### **5.3 Presentation of the Major Urban Regeneration Projects**

The metropolitan area of Helsinki consists of four different municipalities, Helsinki, Vantaa, Espoo and Kauniainen. Each city has delineated its own growth strategy which includes major urban development projects. Nevertheless, the city of Helsinki already has an existing structure which signifies more the need of urban regeneration than the rest of the cities. This structure comprises old industrial areas and harbours which currently form large-scale development projects. The most significant of them are Kalasatama, Pasila and the West Harbour. In Espoo, the T3 area is an innovation hub which includes the districts of Tapiola, Keilaniemi and Otaniemi. Currently, the centre of Tapiola is under reconstruction following the prototype of the garden city. These four schemes constitute the main projects of this case study and are shortly presented below.

#### Kalasatama Centre

The project is also known as REDI and comprises the heart of the Kalasatama area, an old harbour adjacent to the Helsinki inner city. REDI establishes a high rise development scheme which includes six apartment towers, hotel and office towers reaching approximately 130 meters height. In addition a commercial and recreational centre will be developed as well as social and health care facilities. The completion of the project is estimated in 2022 and it will start with the opening of the shopping mall in 2017 and it will continue with the first residential tower in 2018. Kalasatama centre constitutes a small urban settlement within the city of Helsinki that it will gather about 2,000 inhabitants who will be integrated into a wider residential area for 20,000 people. Its strategic location underpins all means of transport providing excellent accessibility to the residents, employees and visitors. (Helsinki City Plan, 2013; <http://www.redi.fi/en/>)

#### Central Pasila

The new centre of Pasila is called Tripla and consists of three high rise building complex which includes a shopping centre, residential and office units, a hotel as well as a public transport terminal. The aim of the project is to create a business and media hub, a second centre within the city structure. The permitted building volume reaches 183,000 floor sqm which be roughly allocated as follows: 10% residential, 5% hotel, 10% business park and

medical centre, 35% shopping centre and leisure, 15% train station and headquarter office, 10% parking and metro station and 15% land areas. The completion of the project is anticipated in 2021. The wider area will form a settlement of 1,000,000 sqm of new office space, 500,000 sqm of housing, and it will attract 40,000 new jobs and 12,000 inhabitants by 2040. (Helsinki City Plan, 2013; YIT Capital Markets Day, 2014; [http://www.yit.fi/en/yit\\_fi/tripla\\_en/](http://www.yit.fi/en/yit_fi/tripla_en/); <http://en.uuttahelsinki.fi/pasila>)

### West Harbour

The West Harbour comprises a waterfront inner city district which is divided into five smaller areas/ projects, Jätkäsaari, Hernesaari, Salmisaari, Telakkaranta, and Ruoholahti. Jätkäsaari refers to the Wood City quarter, a partnership between Stora Enso and SRV, which incorporates innovative building technology in a mixed-use development scheme. Hernesaari is the busiest ship terminal in Finland which will mix residential blocks with a business centre and a canal where the residents may enjoy boat activities. Telakkaranta will be developed by Skanska and includes housing for 300 people, business and culture activities as well as a beach pier area with cafes and restaurant along the promenade. In total the West Harbour spreads in a surface of 200 ha, its seaside trail reaches nearly 16 km and by 2030 the project is estimated to attract 30,000 residents and 20,000 jobs. (Helsinki City Plan, 2013; (<http://www.uuttahelsinki.fi/fi/lansisatama>; <http://www.woodcity.fi/en/>)

### Tapiola Centre

The new centre of Tapiola is called AINOA and it will be completed in three phases of which the first was accomplished in October 2013. This first stage includes shopping stores, cafes and restaurants, pedestrian zones and meeting venues as well as a public transport terminal. In addition, a parking garage of 1600 spots will be constructed. The next stages comprise residential and business units, the beginning of the West Metro operations, the moving of the bus terminal indoors as well as various refurbishments of the commercial premises and reformations of the urban landscape. (<http://www.ainootapiola.fi/en/> )

## **5.4 Questionnaire development**

The questions comprise a guide in order to stir the discussion with the interviewees and provide answers for the research propositions as well as connect the empirical data with the literature review findings (Yin, 2013). Some adaptation of the questions occurred according to the background of the respondent, i.e. whether he is regarded as a property developer or real estate investor. These adaptations have no impact to the quality of the results.

The questions cover three main topics:

- Urban regeneration and the evaluation of investment opportunities
- Risk management process
- Communication between developers and investors concerning the identified risks

The first topic plays the role of content mapping or in other words introduces the subject to the interviewee, provides a specific frame for the discussion and signifies his/ hers perception. The second and the third one elaborate the discussion attempting to mine more details about specific parts of the investment analysis within urban regeneration context. The detailed questionnaire can be found in the Appendix I. (Richie et al., 2013)



## **5.5 Data Analysis**

The analysis of the data relies on the theoretical propositions which are reflected in the research question as well as the literature review findings (Yin, 2013). These propositions also assist in shaping the data as in-depth interviews accumulate enormous amount of information. Since no tape recorder was used, the data shaping occurred through notes that were kept during the interviews. This might have led to an unsystematic way of reducing the data at some extent; nevertheless, the data reduction was conducted inductively as Seidman (2012) denotes.

The interview notes were further transcribed in order to achieve the proper sequence of the text that subsequently would facilitate the data management. Although this process provides some preliminary conclusions, the actual analysis of the data began only after all the interviews had been implemented. Furthermore, any emerging misconceptions during the transcription were clarified with follow up contacts with the interviewees.

## **5.6 Ethical Issues and Confidentiality**

The purpose and the objectives of the study were clearly explained to the interviewees in advance in order to guarantee their participation in the research. All the disclosed information was treated confidentially in terms of avoid linking the participants with any specific opinion. In addition, the author assures the anonymity of the respondents without mentioning their names at any part of the study. As a result, the thesis achieves to follow the ethical and confidentiality patterns as they are described by Seidman (2012).

## 6 Analysis of the Results

### 6.1 Issues with Interviews and Research Difficulties

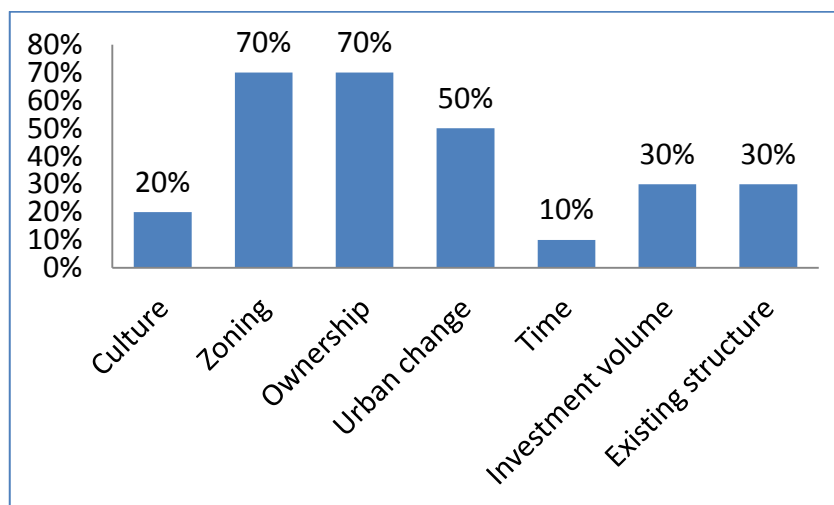
The goal of interviews is to understand the experience of the respondents who use their personal expressions and style in order to describe it (Seidman, 2012). Therefore, an issue of interpretation might arise which is managed through clarifying questions based on the research propositions in order to build a common terminology for the analysis of the data. Although the sample of the interviewees is quite homogeneous certain differences in their backgrounds exist and thus crafting their profiles might be considered as essential. As Seidman (2012) argues, profiles enable the investigator to clarify the intentions of the respondents and convey all their main premises in the analysis.

Furthermore, coding the data or producing thematic connections comprises a challenging task when dealing with large amount of information. Many researchers employ computer software in order to classify, sort, file, and reconnect interview data. In this case study the usage of computer programs is not considered necessary as the material which derives from ten interviews can be managed efficiently without it.

Finally, time and the sensitivity of business issues pose barriers and limits to the research process. Arranging the interviews might be time consuming which affects significantly the time schedule of the study. Also, risk management issues are attached to the business strategy of each company and thus the subject is considered very sensitive in order to proceed deeply to details. Nevertheless, the general concept of the adopted methods and followed processes has been captured so as to reach to definite conclusions.

### 6.2 The Core Elements of Urban Regeneration and the Role of the Private Sector

The contextual framework of urban regeneration sets a solid basis in order to conduct the investigation of investment opportunities within certain borders and probe the role of the developers and investors. Although developers and investors comprise two different actors of urban regeneration process, their business endeavours appear many similarities. As a result, their aspect on the core elements of urban regeneration includes seven factors as they are presented in the next graph.



**Figure 6.1 The Core Elements of Urban Regeneration**  
Percentage of a sample of 10 interviews

The interviewees were requested to express their opinion intuitively without any thorough examination or comparison of the factors. An element with high percentage may signify a great impact in the progress of a regeneration scheme however does not imply a greater significance as each project consists of different characteristics which makes such a comparison insufficient.

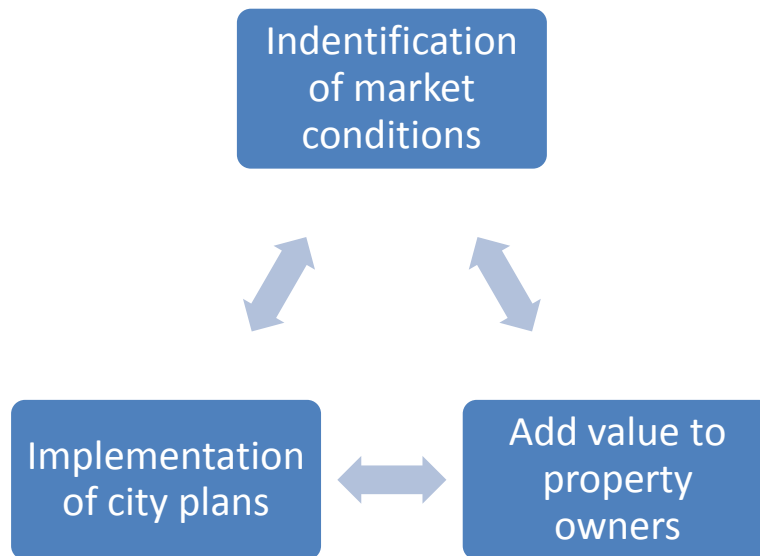
Seven respondents denote zoning and ownership in terms of property rights as significant features of urban regeneration. Zoning refers to the urban planning guidelines which are provided by the city as the only responsible authority for this procedure. Therefore, zoning poses certain restrictions in the regeneration process or provides the desirable flexibility to the developers. Furthermore, the interference of the public sector extends to the ownership status as the state and the municipalities comprise major property owners in Finland.

Property rights raise conflicts amongst the involved parties which might initiate prolonged negotiations. A main distinction of property owners can be made between public and private ones. Beside this, one of the respondents further divided the private owners to individuals and professionals. The difference between them lies in the fact that individuals have a completely different approach from the professionals. The latter appear more flexible as their interests do not deviate significantly compared to the interests of the developers. In the case of the public ownership, the municipality in relation to urban planning monopoly concentrates excessive negotiation power which has a great impact in the regeneration process as a whole.

Urban change in terms of physical renewal and utilisation of land stands as the third element which is highlighted by half of the respondents. This physical renewal comes as a necessary response to certain urban problems and constitutes a main difference between Greenfield development and urban regeneration. In particular, the developers ought to take into consideration the existing structure of the site and its cultural background when evaluating the investment potentials. These two elements are indicated as separate factors by the 30% and 20% of the interviewees respectively. In fact, one developer highlights the consideration of the history and the culture of the location as a competitive advantage of the regeneration scheme.

The investment volume and the required time of its implementation are denoted mostly by the real estate investors and account for 30% of the interview sample. The rationale of this premise is that urban regeneration projects require significantly larger amounts of time and money which expose the investment to higher risk. Specifically, one of the respondents mentions that a typical real estate investment ranges from 5-35 million euro while regeneration schemes engage a minimum of 500 million euro.

The above mentioned funding requirements delineate the role of real estate investors in urban regeneration process. In particular, in all the development schemes the developers seek to attract investors and end users in order to fulfil the goal of certain financial returns. Especially in urban regeneration projects this need is even greater due to the significant capital injections which are imperative. Thus, the early commitment of real estate investors in the regeneration schemes affects greatly its progress.



**Figure 6.2 The Role of Real Estate Developers in Urban Regeneration**

The role of real estate developers initially appears two-fold from their answers: on one hand they undertake the responsibility to implement the plans of the city authorities and on the other hand attempt to add value for the property owners i.e. the investors. In other words, the city draws the development plans and needs the developers to take the risk of the construction who simultaneously attempt to bridge the gap between the planning authorities and the market. In fact, the developers believe, implicitly or explicitly, that they should participate more actively in the urban planning process as the city lacks a deep understanding of the market conditions. This relationship is illustrated as a triangle in the figure above.

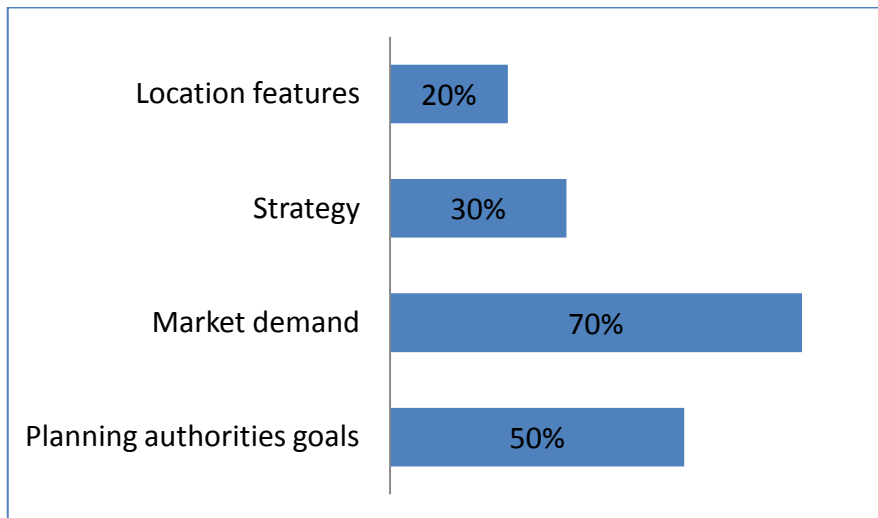
Despite the above described roles, of both the real estate developers and investors, the first aim of the private sector is always to examine the relationship between risk and return. The public sector on its behalf facilitates this procedure by providing the basic infrastructure which enhances the characteristics of the macro locations and makes an investment more attractive. In addition, land packaging plays a significant role in managing the disparate property rights which raise fragmentation barriers.

### **6.3 Land Uses as Investment Opportunities**

The interviewees were asked to describe the rationale for the selection of the land uses which determine the potentials of the investment. Their answers include market demand, the goals of planning authorities, company strategy and location features as they are depicted in the figure 6.3. In fact, the respondents highlighted the current trend of mixed-use development which is underpinned by the city officials, location dynamics as well as the market itself.

In particular, one interviewee mentions that as urban structures move from a monocentric model towards a polycentric one new city centres emerge constantly everywhere. These new centres require the concentration of various services and hence the demand for spaces of high density increases. In addition, one developers states “It is no longer easy to find simple projects in the market, only complex ones which cannot be covered by a sole land use”. Furthermore, regarding the location features one respondent refers to the West metro

line project which creates opportunities for mixed-use development as it attracts residents, employees and visitors.



**Figure 6.3 Drivers for Land Uses Selection**

Percentage of a sample of 10 interviews

However, the combination of disparate land uses can be obscure and thus more clarifications are necessary. According to the majority of the respondents, mixed-use development refers to an area and not to a building. This implies different land use zones in adjacent areas which foster walking distances and commuting by public transportation. Nevertheless, mixed-use buildings can be included in the development plans but usually investors do not favour such investments. Moreover, cost estimation becomes more challenging and technical issues might also arise.

From a strategic point of view, often developers show a strong preference to single use development due to specialisation in certain type of projects. Furthermore, single use schemes have additional advantages such as less complexity and the convenience to attract real estate investors. The latter derives from the fact that investors can align more easily single use properties with a specific strategy that they follow. Therefore, multiple land uses increase the risks and might also put pressures on the profitability of the project. On the other hand, one developer signifies the diversification effect of mixed-use development and perceives multiple land uses as a way to minimise risks by attracting different types of investors.

In practice, the commitment of end users in the scheme guarantees its viability and thus the highest percentage of the market demand in the figure 6.3 implies a higher significance. As the majority of the developers admit, when the end users are found the building permit can be obtained with less effort. Furthermore, the market or investor driven development can be ascertained from the main focus on retail and residential units, as the office market in HMA is currently struggling.

The evidence from the examined urban regeneration projects indicate that retail holds the largest amount of floor space combining leisure activities in order to create a lively environment in the neighbourhood. AINOA and REDI, in Tapiola and Kalasatama respectively, have received their names from the shopping malls that will be constructed in the area. This comprises a typical example where retail constitutes the flagship element of

the regeneration schemes. Furthermore, in Telakkaranta the developer aims to take advantage of the long promenade by providing space for cafes, restaurants and cultural activities.

Nevertheless, despite the recession of the office market in Helsinki region a certain proportion of the new building stock includes new office spaces. The combination of workplaces and living environments comprise one of the key elements of mixed-use development. Accessibility plays the most significant role in the decision making of enterprise location which is obvious in the dynamics of the Pasila project where the proportion of business units equals the residential ones.

In addition to the major commercial and residential uses, the market creates opportunities for hotel and healthcare properties. Especially the latter has increased its attractiveness in the investment market in the last year. According to the KTI report (2014) the weak finances of the municipalities and their ageing population favour service providers as well property investors in this sector. Tripla in Pasila includes a medical centre as well as a hotel will be built in the same project and REDI.

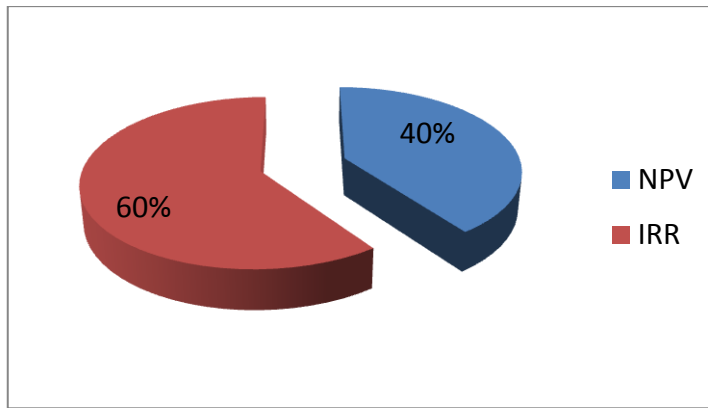
## **6.4 Evaluation of Investment Opportunities**

The large scale of urban regeneration schemes requires a huge amount of capital and time; this leads to the staging of the projects to smaller parts in order to avoid the commitment of excessive funds for long periods. Occasionally these parts might be commissioned to more than one developer. Three developers denote the commissioning of the project as a whole as a key challenge which has a huge impact in the evaluation of the investment. In this case, the developer acts as the coordinator of the project dealing with the various investors and property rights. In addition, adjustment of the investment calculations and cost estimation is required according to each land use. Besides this, the developers should also consider the side of the users as the disparate activities might pose conflicts which raises the management costs.

As a result, an equation is created with the above features, which aims to identify the proper combination of land uses and optimise the profitability of the scheme. Negotiations with the planning authorities play a significant role in drawing alternative development scenarios. Scenario building also determines the option to stage in order to manage the investment process more effectively.

Both developers and investors use cash flow models in order to conduct the investment calculations discounting the future values to present levels. As one of the investors denotes, the discount rate in the case of urban regeneration projects is higher than usual as the investors require higher returns in order to compensate the higher risks. For instance, if a core yield accounts for 7% then the required return for regeneration schemes accounts for a minimum of 10%. Another respondent argues that the higher discount rate signifies the perception of urban regeneration projects as secondary investments. On the hand, when the regenerated area will have been established its properties will be upgraded to prime ones.

Regarding the investment decision rules, investors use the IRR criterion while the developers often use the NPV. Nevertheless, some developers adopt IRR in order to align their calculations with the investors. The next figure depicts the opinion of the respondents on the decision making criterion which indicates a slight preference to the IRR.



**Figure 6.4 DCF Criteria for Decision Making**

Percentage of a sample of 10 interviews

As in all valuations, the final result derives from a number of assumptions which entail a particular level of uncertainty. The analysis of this uncertainty comprises an integral part of the valuation process and it will be examined in detail in the next section. Furthermore, it is worthwhile to mention that two of the respondents believe that overlapping of responsibilities between different departments of the development companies raise certain challenges. This adds extra difficulties in evaluating the investment potentials which already comprises a complex procedure.

## 6.5 Risk Management Process.

### 6.5.1 General perception of the risk management process

From the prior analysis of the urban regeneration process, intricate factors have been identified such as city planning and ownership structures in addition to the composite nature of large scale urban development projects. As it has already been indicated, the developers attempt to confront the uncertainty which derives from those circumstances by staging the projects and/ or negotiating with the involved parties, owners and city officials. This comprises a part of the risk management process which in some cases takes a formal and systematic form while in other it is implemented in a more unsystematic manner.

The systematic approach includes periodical formal meetings supplemented by checklists in order to identify the potential risks. The respondents often call this meetings “Risk/ Investment Committees” and consist of directors and head of departments. Subsequently, an assessment of each risk leads to a certain response and thereafter a monitoring process occurs throughout the construction phase until the completion of the project. On the other hand, the unsystematic risk management process includes informal meetings and occasionally checklists for the risk identification which is followed by a rough estimation of the impact of the identified risks.

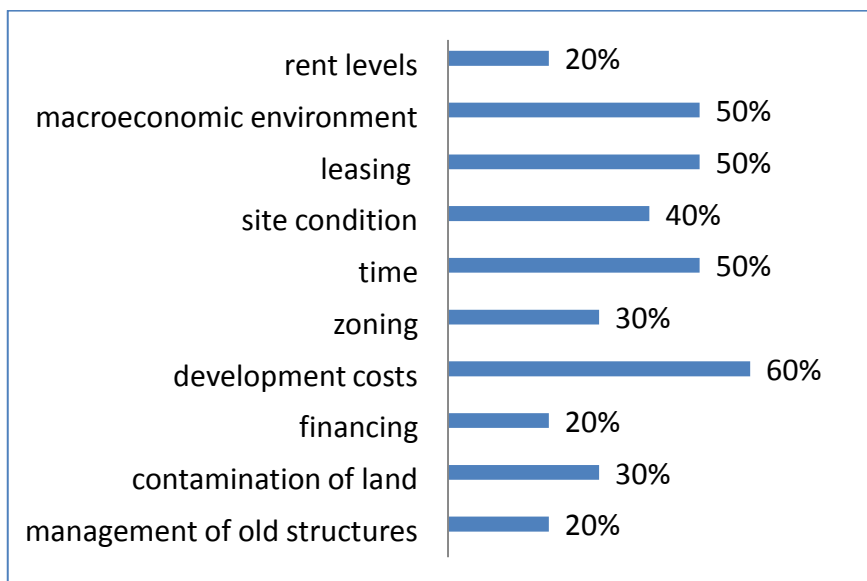
Although a part of the sample stressed the formality of their risk management process, this focuses mostly on qualitative assessment techniques. The quantification of risks derives from the sensitivity analysis of the cash flow models, which is used by all the respondents, but this analysis is based primarily on the previous experience of the developers. In other words, risk analysis greatly relies on intuition rather than a methodological calculation of probabilities. Moreover, risk analysis neglects in a large extend the interdependence of risks. As it can be noticed in the next figure, only three interviewees have established a systematic risk analysis.



**Figure 6.5 Implementation of Risk Analysis**  
Percentage of a sample of 10 interviews

### 6.5.2 Main sources of risks in urban regeneration projects

Almost all the respondents in the request to identify the main sources of risk in urban regeneration process highlighted the fact that risks vary according to the development phase. Among a large number of factors which have an impact in the progress of the project ten types of risk are signified as the most common. Figure 6.6 illustrates these risks and their frequency of appearance in the answers of the interviewees.



**Figure 6.6 Main Sources of Risk in Urban Regeneration Projects**  
Percentage of a sample of 10 interviews

From the figure above, development costs distinguish among the identified risks with a percentage of 60% of the interview sample. In addition, five respondents denote the considerably time consuming process of urban regeneration as an uncertain factor. In particular, one investor notices that the long term horizon of the development decreases the return on the invested capital while the risk remains the same. Simultaneously this affects the commitment of the investors to the scheme. Furthermore, time is highly related to the estimation of costs as it raises challenges for accurate estimates. Also, one respondent perceives time as a determinant factor for emerging competition, as in HMA many urban development projects have been commenced and more are anticipated.



In addition, five interviewees are concerned about the economic situation and the macroeconomic indicators which have a great impact in the property markets. In relation to the economic environment five respondents refer to the risk of leasing, two respondents to the rent levels as well as to the required financing for the fulfilment of the investment. Leasing pertains to the attraction of tenants in order to minimise the vacancy rate but at the same time covenants play a significant role. In times of high uncertainty developers attempt to minimise the volume of the engaged capital covering the financing requirements by own equity. Funding assistance by financial institutions in combination with the long time periods exposes the developers to higher interest rate risk.

Furthermore, technical risks such as the condition of the site and the management of the existing buildings concentrate a percentage of 40% and 20% respectively amongst the interview sample. In addition to these factors the possibility of contamination increases the potential costs as denoted by three respondents. Also, zoning comprises a core element of urban regeneration process which is considered as a risk factor by three interviewees due to imposing restrictions by the planning authorities.

### **6.5.3 Evaluation of options for risk response**

The delineation of different scenarios and the division of the investment to smaller parts comprise a certain method to confront the identified risks. In particular, the option to stage facilitates the management of the investment as it reduces the uncertainty which arises from the long time horizon and the cost estimation becomes more accurate. In addition, the developers examine supplementary options like the option to wait or the option to expand.

However, no values are calculated for these options as this may derive from the Real Option Analysis. In fact, pricing the risks with complex tools such as Monte Carlo simulation it is considered too sophisticated to serve the purpose of project valuation. Instead, all the developers and investors value each risk individually, using the sensitivity analysis, in order to highlight the greatest contributors to the overall risks. Thereafter, they weight the disparate options according to the results of the sensitivity analysis, the requirements of the project, the market forecasts and previous experience in order to reach the final decision.

Furthermore, four respondents highlight that a good occupancy rate can guarantee the commitment of investors in the scheme. In order to deal with the leasing risk, the developers proceed to presales and early rental agreements with potential tenants. Often, finding a reliable anchor tenant is sufficient to attract more tenants and occupy the largest part of the floor space. In addition, three interviewees denote potential partnerships as a measure to mitigate the risks. Also, four developers refer to negotiations with the planning authorities in order to ensure the maximum flexibility and develop the land uses which satisfy better the requirements of the market. This flexibility can assist the developers in the assurance of the required financing.

The existing structures of the site have been identified as a core element of urban regeneration and the dilemma regarding their demolition or retention raises the level of uncertainty. The generation of cash flows comprises the main concern of all the respondents and in particular two of them stress the limitations to exploit the whole surface of the old buildings in order to produce income. Moreover, switching uses can be challenging as the existing structures might not allow the required design flexibility or certain preservation regulations might prevent such an action. Thus, the option to demolish might seem more simple and profitable if no preservation restrictions exist. Nevertheless,

four respondents believe that the old buildings enclose a historical significance which potentially might create higher value for the project.

In addition to the risk elimination measures, some actions which transfer or share the risks are also considered. Firstly, the cost of remediating the potentially contaminated land is often undertaken by the land owner. Secondly, explicit contractual terms aim at avoiding specific risks. A typical example that has been mentioned by three respondents is the “land reservation” and the arrangement of payments for the purchase of land. Land reservation refers to the provision of the municipality to reserve the property rights of a specific plot for a particular developer in order to exploit it. Thus, no actual transaction occurs until the construction begins and the capital expenditure follows the disparate phases of the project.

Finally, one investor denotes money reservations as a measure to respond to any unexpected risk or a risk that has low impact to the project.

#### **6.5.4 Communication of risks to investors and potential partnerships**

The attraction of private investments comprises an inherent feature of a successful urban regeneration scheme. Hence real estate developers focus on the creation of good relationship with the potential investors. The developers on their behalf have to prove the marketability of the development scenarios in order to excite the interest of the investors. A thorough risk analysis and the direct communication of risks establish a better collaboration between the two parties and coordination of their goals. The alignment of the valuation techniques constitutes a good step to enhance this communication. For instance, the developers use cash flow scenarios adopting the IRR criterion which is very common amongst the investors.

Often the investors have a certain list of risks that they are willing to tolerate; in particular, three developers denote the minimum level of occupancy as a major requirement. This commences discussions which essentially revolve around the purchase price which moves conversely to the risks, i.e. the higher the risks the lower the price. Alternatively, the investors might accept a certain price by transferring the difference of the required occupancy rate to the developer. In other words, if the investors require 80% occupancy rate and the developer has achieved 70%, the developer pays the rents of this 10% difference for an agreed period.

Furthermore, the developers investigate the potentials for partnerships through their communication with the investors. Also investors proceed to such partnerships as they aim to achieve better returns. As a result, seven out of the ten respondents denote that partnerships constitute a good measure to mitigate all risks. The case of Kalasatama comprises a joint venture between SRV and domestic institutional investors. In addition, large retail groups like Kesko and HOK which have their presence in disparate urban development projects might play the role of the partner. Occasionally, large scale development projects may involve more than one development companies depending on the requirements of the municipality. However, this cooperation is rarely implemented by an initiation of the developers due to competition law.

A deep analysis of the development options provides the opportunity to the developers to offer more competitive proposals to the investors. One developer argues that often the sensitivity analysis leads to over buffering of costs and this limits the management of risks to a rigid level. Perhaps the employment of more sophisticated methods that produce the quantification of all the potential options might increase the flexibility of the developers.

Furthermore, one of the respondents stresses the experience in redevelopment projects and local market risk as significant factors which increase the confidence of the investors.

## **6.6 Conclusions**

Urban regeneration process consists of various factors of different significance which output a final result of mixing land uses that involve disparate interests. The role of real estate developers lies in the coordination of the market needs with the guidelines of the planning authorities so as to add value to the property owners. In this endeavour, the developers might proceed alone or explore partnership possibilities depending on their strategy, the market conditions or the project requirements.

For the evaluation of the investment opportunities, the developers build cash flow scenarios using either the NPV or IRR criterion. At some cases the management of risks follows a systematic process while in others it is implemented through a more loose structure. Sensitivity analysis is incorporated to the cash flow models in order to assess the impact of the identified risks and conclude the best development scenarios.

Finally, a thorough risk analysis facilitates the communication with the investors and provides a basis in order to examine potential partnerships and mitigate the risks jointly.

## **PART IV – Summary and Research Findings**

### **7 Conclusion and Discussion**

This chapter presents the results of the study and the ways that the research questions were answered through the literature review and the empirical analysis. In addition, the reliability and validity of the study are evaluated as well as further research and development of the topic is recommended. Finally, the chapter summarises the rationale of the thesis, its objectives, structure and methodology.

#### **7.1 Results of the Study**

The main objective of the thesis was to denote the approach of the private sector, particularly the real estate developers, in identifying and evaluating the emerging investment opportunities in urban regeneration projects. The discussion of the three research questions provides the solution to this research problem.

The first research question was to discover the real estate development involvement in urban regeneration. In addition, this question included two sub-topics, regarding the concept of urban regeneration, as well as the evolution of urban policy and the role of the property market. To respond to these issues, the literature review, in the second chapter, provided the theoretical framework of urban regeneration, examined the evolution of urban policy in West Europe and signified the development of large scale real estate projects as a part of urban regeneration. Furthermore, the answers from the first interview question addressed the role of property development within the context of urban regeneration.

In particular, the literature review denoted that urban regeneration is a complex process which consists of four axes: social, economic, physical and environmental. These axes are also supplemented by the goal for sustainability. In order to confront urban decline, various approaches were developed but property-led regeneration prevailed during the 1980s. Since then, these flagship projects have played a catalytic role underpinning mixed-use development as the optimal solution for urban regeneration. This indicates collaboration between the public and the private sector which focuses on the identification of market requirements, the provision of funding and sharing the risks. However, funding and risk sharing was criticized due to the extreme risk alleviation by the public sector without receiving any benefits in return.

In a similar vein, the empirical study indicated the promotion of large scale mixed-use schemes for urban regeneration. The role of the real estate developers derives from the implementation of the city plans taking into account the emerging market opportunities. In addition to this role, the developers aim at adding value to the property owners. Thus, the private sector was seen to undertake the development risks without any participation of the public authorities, unlike to the indications of the literature review. In Finland, the public sector appears to leverage the private sector investment only by building the required infrastructure or proving flexibility in urban planning.

The second research question was to examine the ways that real estate developers use to evaluate the emerging opportunities. This question also included a sub-topic regarding the valuation and risks analysis methods that are employed. In chapter three, the literature review presented the existing valuation methods and risk assessment techniques, the DCF and the ROA, in real estate development. Thereafter, in chapter four, the literature review

described the employment of these methods within the context of urban regeneration. The empirical analysis provided a detailed overview of the processes that are used by real estate developers and investors.

The conclusion of the literature review highlighted that the DCF is a simple method to forecast the value of the project considering the time value of money. However, this method fails to capture all the development possibilities and thus it overestimates the risks and decreases the project value. On the other hand, the ROA identifies the latent investment opportunities, computes values for disparate development options and provides higher flexibility in the decision-making process. Despite this superiority, the ROA appears certain drawbacks due to the lack of available data and the complexity of its analysis. Moreover, the variable of competition is absent from the analysis.

In addition, the empirical study illustrated a definite preference of the real estate developers and investors to the DCF method. Both actors delineate various cash flow scenarios and discount the future values to current equivalents. The discount rate reflects the uncertainty of the project value and a sensitivity analysis is embedded in the model in order to evaluate the risks. The majority of the respondents mentioned that they do not follow a systematic risk analysis process and that sophisticated methods such as Monte Carlo simulation do not serve the purpose of project valuation.

The third research question was to explore risk communication between the real estate developers and investors/stakeholders. This issue was supplemented by a sub-question regarding the role of risk communication in financing urban regeneration. The literature review addressed this problem in the section 4.2 and the last part of the interviews focused on risk communication. In particular, the analysis of the literature review signified the concern of the private sector about the great uncertainty in urban regeneration schemes. A thorough assessment of risks can indicate the goals for the planning of public policy and set a solid basis for a wide collaboration. As a result, in order to diversify the risks and achieve a more secure investment environment, the investors solicit more sophisticated and flexible vehicles.

The interview results indicated a tendency of the developers to form partnerships with real estate investors or end-users as a measure to mitigate risks. In particular, real estate developers use similar valuation techniques with the investors, which facilitate the negotiation process regarding risk allocation. Furthermore, a rigorous risk analysis can provide higher flexibility and enhance communication between the two parties.

To summarise, the findings of the case study denoted that the involvement of the public sector confines to city planning and the provision of basic infrastructure. Thus, the allocation of risks occurs between the private actors, the real estate developers and investors. Furthermore, the risk management process that they adopt appears quite unsystematic without complex quantitative methods, such as the ROA. Although the real estate developers and investors admit that the calculation of disparate development options provides a more robust investment analysis, they believe that this is too complicated to be implemented.

## **7.2 Reliability and Validity**

The reliability of the study was firstly established by the thorough collection of the data from scientific sources; and secondly, by conducting interviews with actors who have proven involvement with the real estate market and consequently with the urban

regeneration process. Therefore, according to Yin (2013) the operations of the study can be repeated producing the same results.

The validity of the study can be examined in terms of construct validity and external validity, as they have been defined by Yin (2013). In particular, the thesis used multiple sources of evidence which explain the processes of real estate development and urban regeneration and related them with the research objectives. Furthermore, all the collected data formulated a chain of evidence which linked the described concepts. From the perspective of external validity, the investment analysis in urban regeneration projects was based on well established methodologies. The DCF model has met ultimate acceptance from the professional community worldwide while the ROA has found high recognition in academia.

### **7.3 Further Research**

The literature review highlighted the existence of disparate development options and signified the ROA as the appropriate method for their quantification. However, the majority of the studies focus on the option to stage and wait. As it has been identified, the long-term horizon of the urban regeneration process requires the examination of the option to switch in order to enhance the flexibility of the investment analysis. The provision of flexible design can contribute to the sustainability of the project as the developed uses can be modified according to the restructuring of the urban environment. Therefore, the current thesis recommends a further research on the option to switch.

Furthermore, the literature review and one of the interviewees denoted the significance of competition in project development. Although few papers investigate the combination of the ROA and game theory, the issue of competition has not been examined thoroughly. As property development and urban regeneration process occur within a wide economic environment, the incorporation of competition in the investment analysis is considered as essential.

Finally, the empirical study concluded that the analysis of investment opportunities lacks an explicit risk management process. A quantitative research can underpin the necessity of employing more sophisticated tools which can capture latent opportunities during the project development. The findings from the interviews highlight certain factors that can contribute to the implementation of a quantitative case study. A combination of qualitative and quantitative approach to this research topic can produce more robust results.

## 8 Summary

This thesis attempted to denote an effective way to identify the investment opportunities which emerge from the continuous urban transformations. In order to achieve this purpose, a literature review and a case study were employed. The main objective of the literature review was to establish a theoretical basis for the research propositions which will be validated or rejected by the case study. The thesis focused on the investigation of the emerging investment opportunities from the perspective of real estate developers, and aimed to discover the channels for communicating the risks to real estate investors.

The literature review consists of three chapters, the theoretical framework of urban regeneration, the investment analysis of real estate development, and the examination of urban regeneration as an investment process. The concept of urban regeneration includes four dimensions, the economic, social, physical, and environmental. These dimensions are supplemented by the goal of sustainability in order to build a broad definition of urban regeneration. This definition highlights a comprehensive and integrated policy which confronts urban decline and spurs sustainable development. The experience from the UK and other European countries indicated a strong relation between urban regeneration and real estate development which is expressed through large scale urban development projects.

Furthermore, real estate development comprises a complex process within a wide economic context and entails great uncertainty regarding the final outcome. The DCF model is the most commonly used method to estimate the final value of the project, and it calculates all future costs and incomes in current financial terms by using a discount rate. Therefore, this model takes into account the time value of money when calculating the Net Present Value. In addition, it embeds a sensitivity analysis in order to determine the influence of each input variable.

However, the DCF appears a single dimensional approach, for such complex projects, as it greatly relies on the discount rate which reflects all the inherent risks. In addition, the estimation of the discount rate occurs in a definite time without capturing the dynamic character of the process. The ROA responds to this encumbrance as it examines disparate options during the development process, providing numerical values to each one of them. In particular, various authors have identified a number of real options in real estate development such as the option to defer, stage, switch or abandon. The advanced quantitative methods, such as Monte Carlo simulation, that the ROA uses result in a thorough risk assessment compared to the implicit adjustment of the discount rate.

In addition, urban regeneration comprises a time-consuming investment process with certain content, context and organisation. The involvement of disparate stakeholders, from the public and private sector, requires a strategic vision which will define the content of the scheme with clarity. Furthermore, the management of the various networks and resources determine the successful organisation of the process. Finally, the context of urban regeneration consists of its four dimensions, economic, social, physical and environmental.

The investment potentials arise from a compact development with mixed-uses which provides risk diversification effects. However, mixed-use schemes entail higher management costs and design complexity, as well as they might raise conflicts between the different land uses.

The findings of the literature review concerning the appraisal of urban regeneration projects indicated that the DCF overestimates the risks and underestimates the project value. On the contrary, the ROA identifies latent opportunities incorporating the required flexibility in the investment analysis which increases the value of the project. Thus, a rigorous investment analysis decreases the level of uncertainty and triggers the participation of real estate investors in urban regeneration schemes. However, the rigor of the analysis occurs at the expense of simplicity as its results derive from sophisticated methods which are rather obscure and confusing. Moreover, the ROA suffers from the lack of empirical data in order to compute the volatility of the input variables and excludes competition from the analysis. Finally, certain options, such as the options to switch have found limited recognition in the literature.

The empirical analysis includes a case study from the real estate market of Helsinki Metropolitan Area, where the planning authorities have decided to commence various urban regeneration projects. The case study was implemented by semi-structured interviews with real estate developers and investors. The main criterion for the selection of the interviewees was the participation in the urban regeneration of HMA. Consequently, the sample includes the major construction companies which operate in Finland. Due to the small number of these companies the sample was supplemented by real estate investors, using the snowball or chain sampling as well as a consulting company which provides property development services. The selected companies are involved in four major urban regeneration schemes, the Kalasatama Centre, Central Pasila, West Harbour, and Tapiola Centre.

Furthermore, the questionnaire covers three main topics, urban regeneration, risk management process, and communication of risks between real estate developers and investors. The data analysis relied on the research propositions and the data shaping occurred through notes during the interviews. These notes were further transcribed in order to achieve the proper sequence of the text and facilitate the data management. In addition, all the disclosed information was treated confidentially and the author assured the anonymity of the respondents.

The research findings of the case study denoted the core elements of urban regeneration and the role of real estate developers in the process, the drivers for land uses selection, the valuation methods and the risk analysis process. In particular, the core elements of urban regeneration include zoning, ownership, urban change, investment volume, existing structure, and culture. Every feature affects urban regeneration process in a certain way and extent which varies according to the characteristics of each project. Furthermore, the role of property developers lies in the identification of market conditions, the



implementation of city plans, and the added value to the property owners. In addition, the four main motives for land use selection consist of the market demand, goals of planning authorities, business strategy, and location features.

As far as the evaluation of the investment opportunities is concerned, both real estate developers and investors use cash flow models showing a slight preference to the IRR criterion than the NPV. Only a small proportion of the respondents adopt a systematic risk analysis, in terms of conducting formal periodical meetings, assess the risks as well as respond to them, and subsequently monitor their progress. The majority of the interviewees conduct informal meetings followed by a rough estimation of the impact of the identified risks. Even those participants who have adopted a systematic risks analysis limit their assessment to the results of the sensitivity analysis, neglecting the correlation of risks and relying on intuition.

Although real estate developers delineate different scenarios and divide the development process into disparate stages, they consider pricing the risks with complex tools such as Monte Carlo simulation too sophisticated. Instead, they prefer to weight the identified options based on market forecasts and their previous experience. Furthermore, property developers attempt to respond to certain risks, such as the vacancy rate, with presales or ensure the required planning flexibility by negotiating with the public authorities. In addition, the developers examine the potentials for partnerships with real estate investors in order to mitigate the risks of the development. The alignment of the valuation techniques, as well as the direct communication of risks constitute good measures for the establishment of a successful collaboration.

In conclusion, the results of the empirical analysis underpin the findings of the literature review. The dynamic process of urban regeneration requires explicit methods in order to analyse the investment opportunities and capture the inherent uncertainty. On the other hand, the complexity of such methods leads the real estate developers and investors to the adoption of less rigorous models which are more simple to comprehend.

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# **Appendix I: Questionnaire for the Interviews**

## **Urban Regeneration**

1. How do you perceive the role of property development within the context of urban regeneration?
  - a. Can you tell any differences between a typical real estate development project and an urban regeneration project?
2. How do you evaluate the emerging investment opportunities?
  - a. Is there a difference in the evaluation between property development and urban regeneration?
3. Do you believe that these opportunities emerge mostly from single-use or mixed-use development?
  - a. What is the reason?
  - b. What are the implications in risk management actions?
  - c. (If they answer single use development maybe I can ask if there is any variation to risk management actions depending on what type of property they build)
4. Is there a standardised procedure that is being followed when realising the development plans or do you treat each project completely as unique?
  - a. What are the implications in risk management actions?

## **Risk Management**

5. What are the main sources of risks in Urban Regeneration projects?
6. What measures can be taken in order to respond to these risks? (If staging is the case then I can ask how they evaluate it and likewise for any other answer)
  - a. Do you use any specific risk management techniques?
  - b. How do you consider alleviation (transfer to public authorities) of risks? How can it be implemented?
7. Usually Urban Regeneration includes two options, demolish and redevelop or modification of the existing use. How do you evaluate these options?
  - a. Do you take any other specific options into account, such as the option to wait or the option to stage?
  - b. Are there any other options that you could mention? How do you evaluate them?
8. Do you think that this kind of options should be evaluated?
  - a. Do you have any specific method for valuating these options?
  - b. Would your risk management analysis benefit from valuating these options?

## **Communication of risks to investors**

9. How do you communicate risks to potential investors?
  - a. How does this communication affect the financing of urban regeneration projects?
10. Have you recognized any limitations in your risk assessment methods?
  - a. Do these limitations affect the communication with potential investors?
11. Do you believe that the above mentioned options could help in communicating the risks to potential investors?
  - a. Could this help acquiring financing for urban generation projects?

## Appendix II: Interviews List

A/A	Company	Department	Date
1	Skanka	Project Development Services	28/10/2014
2	Newsec	Property Development	28/10/2014
3	YIT	Transactions	5/11/2014
4	YIT	Urban Development and Corporate Relations	7/11/2014
5	LähiTapiola Real Estate Asset Management Ltd	Real Estate Investments	2/12/2014
6	Renor Ltd	Top Management	3/12/2012
7	Lemminkäinen	Property Development	5/12/2014
8	Pohjola Property Management Ltd	Top Management	10/12/2014
9	NCC	Business Premises Solutions	19/12/2014
10	SRV	Project Development	12/1/2015